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ABSTRACT

This report presents data on the demographic and employment characteristics of the United State's doctoral scientists and engineers. This population consists primarily of individuals living in the United States who hold science or engineering doctoral degrees from U.S. institutions. Current estimates of the supply and utilization of doctoral personnel in science and engineering were developed from data collected in the 1989 Survey of Doctorate Recipients. In addition to the detailed statistical results of the 1989 survey, this report contains selected time-series data from previous biennial surveys. The time-series tables present data on the number of employed scientists and engineers by demographic characteristics such as citizenship, place of birth, and field of degree and employment-related characteristics such as occupation, sector of employment, median salary, and various labor force rates. Some tables in this report provide estimates for doctoral scientists and engineers employed in four year colleges and universities. In addition to general notes, this report includes detailed statistical tables, technical notes, and a copy of the survey instrument. The statistical tables section includes time-series, and employment and salary detail tables. The technical notes section contains information on survey methodology, coverage, concepts, definition, and sampling errors. (KR)

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Characteristics of Doctoral Scientists and Engineers in the United States: 1989

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Marjorie Lueck

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Section I. General Notes

This report presents data on the demographic and employment characteristics of the Nation's doctoral scientists and engineers. This population consists primarily of individuals living in the United States who hold science or engineering (S&E) doctoral degrees from U.S. institutions.[1]

Current estimates of the supply and utilization of doctoral personnel in science and engineering were developed from data collected in the 1989 Survey of Doctorate Recipients (SDR), the ninth in a biennial series. The first, conducted in 1973, included individuals who had received doctorates between January 1, 1930 and June 30, 1972. The sampling frame for each subsequent survey maintained a 42-year coverage span by adding the two most recent graduating cohorts and dropping the two oldest. The population for the 1989 survey includes those granted doctorates between January 1, 1946 and June 30, 1988.

In addition to the detailed statistical results of the 1989 survey, this report contains selected time-series data from previous biennial surveys. The time-series tables present data on the number of employed scientists and engineers by demographic characteristics such as citizenship, place of birth, and field of degree and employment-related characteristics such as occupation, sector of employment, median salary, and various labor force rates. Of further note, some tables in this report provide estimates for doctoral scientists and engineers employed in 4-year colleges and universities.

This report differs somewhat from past reports in this series. Data are tabulated on the employed doctoral S&E population rather than the total doctoral S&E population, except where labor force participation rates are involved. Also, the table formats were redesigned, and there is much greater use of percentages rather than absolute numbers.

In addition to this **General Notes**, this report includes Detailed Statistical Tables, Technical Notes, and the Survey Instrument. The Detailed Statistical Tables unit includes time-series, and employment and salary detail tables. The Technical Notes section contains information on survey methodology, coverage, concepts, definitions, and sampling errors.

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[1] The population estimates also include some individuals who received a foreign doctoral degree prior to 1973 and some individuals with non-S&E doctoral degrees who are employed in S&E. These individuals comprise about four percent of the sample.

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Table 1. Employed doctoral scientists and engineers, by field: 1973-89

Field	1973	1975	1977	1979	1981	1983	1985	1987	1989
Total	220,332	255,940	285,055	314,257	343,956	369,320	400,358	419,118	448,643
SCIENTISTS	184,551	213,507	240,005	263,915	286,917	307,775	334,505	351,350	373,860
Physical scientists	48,526	54,629	57,531	60,222	63,110	63,986	67,480	68,647	70,209
Chemists	30,769	35,825	37,412	39,659	41,910	41,298	43,735	44,136	45,649
Physicists/Astronomers	17,757	18,804	20,119	20,563	21,200	22,688	23,745	24,511	24,560
Mathematical scientists	12,130	13,611	14,609	15,250	15,569	16,379	16,758	16,699	17,611
Mathematicians	10,661	11,864	12,846	12,843	13,024	13,589	13,957	13,878	14,867
Statisticians	1,469	1,747	1,763	2,407	2,545	2,790	2,801	2,821	2,744
Computer/Information spec	2,713	3,528	5,767	6,684	9,064	12,164	14,964	18,571	19,797
Environmental scientists	10,321	12,103	13,001	14,575	15,909	16,467	17,288	17,811	19,787
Earth scientists	8,552	9,500	9,715	11,083	11,990	12,523	13,202	13,577	15,138
Oceanographers	1,130	1,277	1,563	1,662	1,793	1,742	1,959	2,037	2,460
Atmospheric scientists	639	1,326	1,723	1,830	2,126	2,202	2,127	2,197	2,189
Life scientists	56,665	63,344	70,537	78,857	84,912	92,802	101,838	107,378	115,833
Biological scientists	36,798	39,036	42,069	45,617	49,621	55,205	59,871	61,985	67,250
Agricultural scientists	9,189	10,993	12,112	12,789	13,496	14,536	15,513	15,796	16,504
Medical scientists	10,678	13,315	16,356	20,451	21,795	23,061	26,454	29,597	32,079
Psychologists	24,782	30,001	33,652	37,848	42,829	46,645	52,182	56,378	60,596
Social scientists	29,414	36,291	44,908	50,479	55,524	59,332	63,995	65,866	70,027
Economists	9,674	11,814	12,970	13,978	15,990	16,958	17,925	17,837	18,588
Sociologists/Anthropol	6,531	7,910	9,471	10,198	11,007	12,056	12,692	12,933	13,529
Other social scientists	13,209	16,567	22,467	26,303	28,527	30,318	33,378	35,096	37,910
ENGINEERS	35,781	42,433	45,050	50,342	57,039	61,545	65,853	67,768	74,783
Aeronautical/Astron	1,670	2,019	1,987	2,364	2,519	3,684	3,827	5,005	6,367
Chemical	4,458	5,368	5,603	6,166	7,146	6,992	7,122	6,923	7,959
Civil	3,100	3,772	4,066	5,157	6,089	5,317	6,396	6,479	6,951
Electrical/Electronic	7,057	8,538	8,284	8,597	10,630	12,696	14,248	12,601	15,088
Materials science	4,462	4,784	5,244	5,732	6,085	7,422	7,259	8,088	8,280
Mechanical	3,257	4,033	4,648	5,245	5,370	5,657	6,594	6,711	7,390
Nuclear	1,264	1,680	1,773	2,286	2,061	2,329	2,377	2,151	2,437
Systems design	1,963	2,436	3,556	4,931	5,349	3,891	3,683	3,935	3,896
Other	8,550	9,803	9,889	9,864	11,790	13,557	14,347	15,875	16,415

NOTES: All numbers in the table are estimates derived from a sample.

All doctoral scientists and engineers employed in a science or engineering (S&E) field were categorized by their field of employment when that information was available. When it was not, or when the employment field was other than science or engineering, doctorate holders were categorized by their field of degree.

SOURCE: National Science Foundation/SRS, 1989 Survey of Doctorate Recipients

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Table 2. Employed doctoral scientists and engineers, by demographic characteristics: 1973-89

[Percent distribution]

Characteristics	1973	1975	1977	1979	1981	1983	1985	1987	1989
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Sex									
Men	92.3	91.4	90.3	89.4	88.1	86.8	85.4	84.1	82.8
Women	7.7	8.6	9.7	10.6	11.9	13.2	14.6	15.9	17.2
Race									
White	91.9	91.1	90.7	90.9	90.0	89.6	89.1	89.2	88.6
Asian/Pacific Islander	4.7	5.3	5.7	7.3	8.0	8.1	8.7	8.7	9.2
Black	.9	1.0	1.0	1.0	1.2	1.3	1.4	1.5	1.6
Native American	.1	.1	.1	.1	.1	.1	.1	.1	.2
Other	.1	.1	.1	**	.1	.1	.1	.1	.1
No response	2.3	2.5	2.5	.6	.6	.8	.6	.4	.3
Ethnicity									
Hispanic	.7	.8	.9	1.3	1.4	1.5	1.5	1.7	1.8
Non-Hispanic	42.4	45.4	54.1	92.7	94.7	94.0	95.1	96.1	96.5
No response	56.8	53.8	45.0	6.0	3.9	4.5	3.4	2.3	1.7
Age									
Under 30	4.4	3.7	3.0	2.4	2.4	1.8	1.5	1.2	1.1
30-34	22.6	21.6	18.8	16.8	14.9	13.1	12.1	10.9	9.9
35-39	19.1	20.9	23.4	24.1	22.4	20.6	19.5	17.8	16.7
40-44	16.0	15.7	15.9	17.3	19.6	21.7	21.5	21.1	19.4
45-49	13.6	13.1	13.3	12.8	12.8	14.0	15.6	18.5	19.7
50-54	10.9	11.2	10.9	10.6	10.7	10.8	10.9	11.5	12.7
55-59	7.1	7.2	7.9	8.5	8.7	8.6	8.6	8.8	9.2
60-64	4.1	4.4	4.6	4.9	5.5	6.1	6.6	6.3	6.3
65 or over	2.2	2.1	2.1	2.6	3.0	3.3	3.6	3.8	4.5
No response	**	.1	.1	**	**	**	**	.2	.4
Citizenship									
U.S. total	93.9	94.4	94.0	92.4	93.8	94.2	93.8	93.9	93.7
U.S. native-born	1/	1/	1/	1/	84.8	84.2	83.6	83.5	83.0
U.S. naturalized	1/	1/	1/	1/	9.0	9.6	10.2	10.3	10.7
Non-U.S. total	5.8	5.5	5.9	7.4	6.1	5.8	6.1	6.1	6.3
Non-U.S. perm. Resident	1/	1/	1/	1/	4.6	4.8	4.9	5.2	5.0
Non-U.S. temp. Resident	1/	1/	1/	1/	1.0	.7	1.1	.8	1.2
Geographic division									
New England	7.8	7.7	7.5	7.5	7.8	7.7	7.8	7.6	8.1
Middle Atlantic	20.2	20.0	18.9	18.8	19.0	18.6	18.2	18.2	17.9
East North Central	16.6	16.4	16.3	15.5	15.2	15.2	14.6	14.5	14.7
West North Central	6.4	6.2	6.4	6.3	6.3	6.3	6.0	6.2	6.1
South Atlantic	17.0	17.6	17.6	18.2	17.8	17.7	17.7	18.2	18.3
East South Central	4.3	4.2	4.1	4.2	4.2	4.1	4.2	4.1	3.8
West South Central	7.2	7.1	7.3	7.5	7.6	8.0	8.1	7.9	7.7
Mountain	6.1	6.0	6.3	6.1	6.1	6.2	6.3	6.4	6.2
Pacific	14.3	14.6	15.4	15.7	15.8	15.9	16.8	16.7	17.0
Other U.S.	.2	.3	.2	.2	.3	.3	.2	.3	.3
Place of birth									
U.S.	83.1	83.1	83.7	81.9	81.5	81.2	80.9	81.3	80.6
Canada	1.5	1.4	1.2	1.3	1.2	1.1	1.1	1.1	1.1
Latin & South America	.5	.6	.6	.8	.8	1.0	.9	1.0	1.0
North,Central,West Europe	4.3	4.3	4.0	4.0	3.8	3.5	3.5	3.2	3.4
Eastern Europe	2.1	1.9	1.7	1.8	1.7	1.6	1.6	1.4	1.3
Eastern Asia	3.0	3.4	3.7	4.4	4.8	4.9	5.2	5.0	5.4
Western Asia	2.1	2.2	2.1	2.9	3.3	3.5	3.8	3.9	4.0
Australasia 2/	.3	.3	.3	.4	.4	.4	.4	.5	.4
Africa	.4	.4	.5	.6	.7	.7	.7	.7	.8
No response	2.6	2.4	2.1	1.9	1.8	2.1	2.0	1.7	2.0

** Less than 0.05 percent

1/ Data were not collected before 1981 on U.S. native-born or naturalized citizens or on non-U.S. permanent or temporary residents.

2/ Australasia comprises Australia, New Zealand, Indonesia, and the Phillipines.

NOTE: All numbers in the table are estimates derived from a sample.

SOURCE: National Science Foundation/SRS, 1989 Survey of Doctorate Recipients

Table 3. Employed doctoral scientists and engineers, by employment-related characteristics: 1973-89

[Percent distribution]

Characteristics	1973	1975	1977	1979	1981	1983	1985	1987	1989
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Type of employment									
Science/Engineering	93.6	93.9	91.9	91.7	91.4	88.6	91.3	90.3	90.4
Other/Unknown field	6.4	6.1	8.1	8.3	8.6	11.4	8.7	9.7	9.6
Sector of employment									
Business/Industry, Total	24.2	25.2	25.1	26.4	28.8	30.7	31.4	31.4	32.4
Not self-employed	22.2	22.9	22.5	23.1	24.6	25.8	25.6	24.8	25.1
Self-employed	2.0	2.3	2.6	3.3	4.3	4.9	5.8	6.6	7.2
Educational institution	58.7	58.2	57.5	55.5	54.4	53.1	52.9	52.2	51.5
Univ./4-yr college	56.7	56.1	55.1	53.3	52.1	50.8	50.5	50.0	49.2
Other	2.0	2.1	2.3	2.2	2.3	2.3	2.4	2.2	2.2
Federal govt. (civilian)	8.3	7.4	7.5	7.6	7.3	7.0	6.6	6.6	6.5
State/Local govt	1.9	1.9	1.9	1.9	1.9	2.1	2.1	2.2	2.3
Hospitals/Clinics	2.1	2.9	3.0	3.1	2.9	2.8	2.8	2.9	2.8
Other non-profits	3.6	3.3	3.6	4.0	3.7	3.2	3.4	3.7	3.6
Other/No response	1.2	1.0	1.5	1.5	1.1	1.1	.9	1.0	.9
Primary work activity									
Research and development	32.4	32.2	32.8	31.7	34.9	33.8	33.1	36.8	37.1
Basic research	15.5	14.9	15.3	15.2	16.0	15.5	15.3	15.1	15.1
Applied research	13.0	12.9	12.8	11.7	13.5	12.8	12.3	17.2	17.4
Development	3.9	4.4	4.7	4.8	5.3	5.5	5.5	4.5	4.7
Management/Administration	20.9	20.2	21.3	23.0	17.6	16.7	17.4	16.2	16.4
of R&D	11.9	11.2	10.8	13.7	9.5	8.5	8.7	8.1	7.9
of Other	9.0	9.0	10.5	9.3	8.1	8.2	8.7	8.1	8.5
Teaching	36.3	35.6	31.9	29.4	30.6	29.3	27.9	26.2	25.1
Professional services	3.3	4.0	4.7	5.8	6.7	7.1	7.9	7.8	8.2
Rprt/Stat/Comput activ	1/	1/	1/	1/	1/	1/	1/	2.8	2.9
Consulting	1.8	2.2	2.2	2.9	3.5	3.5	3.5	3.3	3.7
Other/No response	5.2	5.8	7.2	7.2	6.7	9.6	10.2	6.9	6.6
Federal support									
Receiving support	45.2	43.0	42.0	40.3	36.9	39.0	32.3	43.7	44.2
Not receiving support	50.3	53.5	53.7	54.4	46.8	51.5	52.3	52.7	53.0
Status unknown/No response	4.5	3.5	4.2	5.3	16.3	9.5	15.4	3.6	2.7
Area of national interest									
Education	2/	2/	2/	2/	2/	2/	2/	23.5	21.4
Health	2/	2/	2/	2/	2/	2/	2/	21.5	20.8
National Defense	2/	2/	2/	2/	2/	2/	2/	6.7	6.3
Environment	2/	2/	2/	2/	2/	2/	2/	6.0	6.4
Space	2/	2/	2/	2/	2/	2/	2/	1.5	1.5
Communications	2/	2/	2/	2/	2/	2/	2/	3.1	2.9
Agriculture	2/	2/	2/	2/	2/	2/	2/	5.6	5.5
Energy or fuel	2/	2/	2/	2/	2/	2/	2/	5.7	5.0
Mineral resources	2/	2/	2/	2/	2/	2/	2/	.6	.5
Biotechnology	2/	2/	2/	2/	2/	2/	2/	3.1	3.2
Community dev./services	2/	2/	2/	2/	2/	2/	2/	1.2	1.4
Housing	2/	2/	2/	2/	2/	2/	2/	.4	.4
Transportation	2/	2/	2/	2/	2/	2/	2/	1.3	1.3
Other	2/	2/	2/	2/	2/	2/	2/	15.3	14.8
No response	2/	2/	2/	2/	2/	2/	2/	4.5	8.5

1/ This category was first introduced in 1987 to conform to other data series produced by NSF.
2/ Due to differences in categories offered, data collected before 1987 are not comparable to recent data.

NOTE: All numbers in the table are estimates derived from a sample.

SOURCE: National Science Foundation/SRS, 1989 Survey of Doctorate Recipients

Table 4. Median annual salaries of employed doctoral scientists and engineers, by demographic characteristics and field of degree: 1973-89

Characteristics	1973	1975	1977	1979	1981	1983	1985	1987	1989
Total	$20,700	$23,200	$25,600	$29,100	$34,700	$40,100	$44,800	$49,600	$54,600
Sex									
Men	21,000	23,500	26,000	29,900	35,600	40,800	46,000	50,700	56,000
Women	17,400	19,100	20,700	23,100	27,000	31,700	35,500	40,200	44,800
Race									
White	20,800	23,300	25,700	29,300	34,800	40,200	44,800	49,900	54,800
Asian/Pacific Islander	19,400	21,500	23,900	28,300	34,200	40,100	45,400	50,000	55,000
Black	20,700	22,800	23,600	26,200	31,800	36,900	40,000	42,900	48,500
Native American	**	19,100	22,900	26,600	32,700	36,200	42,600	46,000	50,100
Other	17,700	20,600	24,400	22,000	30,100	31,300	40,200	46,300	49,500
Ethnicity									
Hispanic	19,100	22,400	23,800	28,100	33,000	37,200	42,200	47,300	50,000
Non-Hispanic	20,900	23,000	24,700	29,100	34,700	40,100	44,800	49,800	54,700
Age									
Under 30	15,400	16,900	18,500	21,300	26,100	30,300	34,800	39,700	45,100
30-34	17,300	18,800	20,400	22,800	27,400	31,600	35,800	39,700	43,000
35-39	19,600	21,500	23,600	26,600	31,400	35,900	39,200	42,400	47,400
40-44	21,800	24,200	26,500	30,200	35,500	40,400	45,100	48,700	52,700
45-49	24,100	26,200	29,100	32,100	37,500	44,300	48,400	52,400	58,500
50-54	24,900	28,100	30,800	34,100	40,200	44,700	50,200	55,400	60,900
55-59	25,200	28,100	31,600	36,000	41,400	46,200	51,400	57,200	62,000
60-64	25,600	28,600	31,400	35,900	41,200	48,500	51,900	58,800	62,200
65 or Over	24,700	27,600	31,100	36,300	42,000	47,300	51,700	59,100	65,900
Citizenship									
U.S. total	20,900	23,300	25,700	29,400	34,900	40,300	45,000	50,000	55,000
U.S. native-born	1/	1/	1/	1/	34,500	39,900	44,300	48,900	53,900
U.S. naturalized	1/	1/	1/	1/	37,400	44,100	50,000	55,100	60,100
Non-U.S. total	18,900	21,400	23,700	27,600	33,000	37,100	42,300	47,000	50,900
Non-U.S. perm. resident	1/	1/	1/	1/	33,100	37,600	42,600	47,500	52,600
Non-U.S. temp. resident	1/	1/	1/	1/	30,900	33,900	40,400	39,300	40,700
Geographic division									
New England	20,400	22,600	24,800	27,800	32,400	38,500	44,300	48,800	55,300
Middle Atlantic	22,100	24,600	26,800	30,500	35,900	41,400	46,500	51,200	57,100
East North Central	20,500	22,600	25,200	28,500	33,900	38,900	43,200	48,800	53,300
West North Central	19,400	21,500	23,800	27,400	31,600	36,700	40,400	44,400	48,900
South Atlantic	21,600	24,100	26,500	30,400	36,200	40,900	45,600	50,400	54,800
East South Central	18,700	20,900	23,200	26,600	31,600	35,700	40,200	45,000	50,000
West South Central	19,500	22,600	24,900	28,300	34,300	40,300	43,400	46,100	50,700
Mountain	19,900	22,000	25,000	28,900	34,400	40,200	43,900	48,200	52,000
Pacific	21,100	23,700	26,100	29,700	36,200	41,700	46,800	52,600	58,400
Other U.S.	17,600	20,100	20,280	23,400	25,900	31,100	29,900	32,700	36,800
Field of degree									
SCIENTISTS	20,500	22,700	25,000	28,400	33,600	38,700	42,900	48,100	52,600
Physical scientists	21,500	24,200	26,900	30,700	36,900	43,100	48,600	53,200	58,500
Chemists	21,400	24,300	27,200	30,800	36,900	42,700	47,800	52,100	56,700
Physicists/Astronomers	21,500	24,000	26,700	30,500	36,800	43,900	50,000	55,100	60,400
Mathematical scientists	19,600	21,700	23,800	26,400	31,700	37,800	43,200	49,000	55,100
Mathematicians	19,300	21,300	23,400	25,900	31,200	37,300	42,700	48,600	54,500
Statisticians	22,100	25,100	27,400	31,200	34,700	41,800	48,000	53,700	59,400
Computer/Information spec.	19,900	21,600	23,800	28,400	35,200	42,100	50,000	55,600	61,400
Environmental scientists	20,300	22,900	25,400	29,100	35,200	40,600	45,600	50,100	53,700
Earth scientists	20,300	23,100	25,600	29,900	35,900	41,100	46,400	50,500	54,300
Oceanographers	19,000	20,600	23,100	25,900	30,700	35,500	39,800	46,100	50,300
Atmospheric scientists	21,700	24,200	27,900	32,700	36,100	43,300	47,900	48,600	57,400
Life scientists	19,900	22,100	24,600	28,000	32,800	37,000	41,200	45,400	50,500
Biological scientists	19,800	21,800	24,200	27,100	32,300	36,600	40,900	45,100	50,500
Agricultural scientists	19,300	21,600	24,200	28,000	32,400	36,900	40,800	43,500	48,100
Medical scientists	22,100	24,900	27,500	31,500	36,700	40,200	43,700	48,700	53,000
Psychologists	20,200	22,000	24,000	26,600	30,700	35,800	39,800	44,700	50,100
Social scientists	20,300	22,200	24,400	26,800	31,300	36,100	40,600	45,600	50,500
Economists	22,200	24,600	27,300	31,000	36,800	42,000	46,600	51,400	58,200
Sociologists/Anthropol.	19,500	21,000	22,400	24,400	28,900	33,400	37,200	41,800	45,700
Other social scientists	19,200	20,900	22,900	25,300	29,800	34,900	38,400	44,300	48,900
ENGINEERS	21,900	24,900	28,300	32,700	40,100	46,500	52,400	58,200	62,400
Aeronautical/Astron	21,800	23,800	27,000	32,400	38,400	48,300	53,700	61,800	60,900
Chemical	22,500	26,600	30,600	34,900	43,500	51,200	56,000	60,000	62,200
Civil	20,900	23,600	26,700	30,300	38,400	45,100	50,000	53,900	61,000
Electrical/Electronic	22,200	25,000	28,300	35,100	40,900	48,500	56,700	65,400	72,600
Materials science	22,500	25,400	28,700	32,900	39,000	46,200	50,600	56,200	61,000
Mechanical	21,900	24,500	27,700	30,800	40,200	46,500	52,500	57,000	62,200
Nuclear	20,100	24,000	27,800	32,800	37,100	46,000	54,200	56,800	63,100
Systems design	22,200	24,400	26,700	28,600	38,600	49,200	55,000	63,200	67,300
Other engineers	21,400	24,300	27,600	31,300	38,000	42,400	48,500	53,100	57,800
OTHER FIELDS	20,700	23,200	24,800	25,900	29,500	34,200	37,600	41,000	46,000

** Median salaries were not computed for groups with fewer than 20 individuals reporting salary.

1/ Data were not collected before 1981 on U.S. native-born or naturalized citizens or on non-U.S. permanent or temporary residents.

NOTES: All numbers in the table are estimates derived from a sample.

Median salaries were computed only for full-time employed civilians.

SOURCE: National Science Foundation/SRS, 1989 Survey of Doctorate Recipients

Table 5. Median annual salaries of employed doctoral scientists and engineers, by employment-related characteristics: 1973-89

Characteristics	1973	1975	1977	1979	1981	1983	1985	1987	1989
Total	$20,700	$23,200	$25,600	$29,100	$34,700	$40,100	$44,800	$49,600	$54,600
Field 1/									
SCIENTISTS	20,400	22,600	24,900	28,200	33,300	38,200	42,500	47,800	52,200
Physical scientists	21,000	23,900	26,600	30,300	36,200	42,300	47,000	51,400	56,000
Chemists	21,000	24,000	26,600	30,400	36,200	41,900	46,000	50,500	55,000
Physicists/Astronomers	21,000	23,700	26,500	30,100	36,100	42,900	48,400	53,400	58,600
Mathematical scientists	19,200	21,200	23,300	26,400	31,300	36,600	42,100	46,600	51,600
Mathematicians	19,000	20,900	23,100	26,100	30,900	36,400	41,800	46,600	51,600
Statisticians	20,900	23,100	25,100	29,400	34,600	37,400	43,700	46,700	51,500
Computer/Information spec	21,700	23,400	25,800	28,600	34,400	40,400	46,000	54,400	58,500
Environmental scientists	20,700	23,500	25,900	30,300	36,400	40,900	46,600	50,300	55,100
Earth scientists	20,700	23,600	25,900	30,300	36,900	41,500	47,500	50,800	55,700
Oceanographers	19,700	22,100	24,100	28,800	31,800	36,700	42,300	44,300	50,600
Atmospheric scientists	22,500	24,200	28,500	31,400	36,300	41,600	47,300	50,000	53,300
Life scientists	20,100	22,200	24,700	28,100	33,000	37,300	41,700	45,700	50,700
Biological scientists	19,400	21,300	23,800	26,500	31,600	36,200	40,500	44,500	50,200
Agricultural scientists	19,700	21,800	24,500	28,400	32,800	37,900	41,200	44,300	48,700
Medical scientists	22,700	25,700	27,900	30,900	37,700	41,200	45,900	50,400	55,300
Psychologists	20,200	22,100	24,100	26,700	30,700	35,800	39,500	44,300	50,100
Social scientists	20,300	22,200	24,300	26,600	31,000	36,000	40,500	45,300	50,400
Economists	22,000	24,400	26,900	30,900	36,400	41,400	46,100	50,800	58,100
Sociologists/Anthropol	19,400	20,600	22,200	24,000	28,400	32,100	37,200	41,700	45,800
Other social scientists	19,500	21,100	23,300	25,400	29,800	35,000	38,300	44,100	48,600
ENGINEERS	22,300	25,200	28,600	33,100	40,200	46,600	52,400	58,100	62,500
Aeronautical/Astron	24,200	25,200	27,800	30,900	41,300	47,500	53,800	60,900	60,800
Chemical	22,400	26,400	30,700	36,400	42,900	50,600	55,700	58,900	62,700
Civil	20,400	22,900	26,000	29,900	37,400	42,500	48,500	53,300	58,300
Electrical/Electronic	22,500	25,000	29,000	34,800	41,200	48,600	55,100	60,500	67,100
Materials science	22,800	25,700	29,500	33,400	40,000	47,400	51,800	58,000	61,700
Mechanical	21,500	23,800	27,300	30,800	38,700	45,500	51,100	55,700	60,700
Nuclear	22,500	25,500	29,500	32,700	38,300	46,200	54,200	58,900	65,800
Systems design	23,000	25,800	29,100	35,000	40,000	48,400	54,600	62,200	68,500
Other engineers	22,300	25,600	28,400	33,200	39,400	45,300	51,900	56,700	61,500
Years of Prof. experience									
Less than 5	2/	2/	2/	2/	2/	2/	33,600	36,900	40,700
5-9	2/	2/	2/	2/	2/	2/	38,400	42,700	47,500
10-14	2/	2/	2/	2/	2/	2/	44,800	48,600	52,900
15-19	2/	2/	2/	2/	2/	2/	49,100	54,100	59,900
20-24	2/	2/	2/	2/	2/	2/	51,300	58,100	63,100
25-29	2/	2/	2/	2/	2/	2/	54,400	60,700	67,000
30-34	2/	2/	2/	2/	2/	2/	58,800	63,900	70,000
35 or more	2/	2/	2/	2/	2/	2/	60,200	67,800	74,100
Sector of employment									
Business/Industry, Total	23,300	26,000	29,900	33,700	40,300	47,000	52,000	57,400	61,500
Not self-employed	23,100	25,900	29,600	33,500	40,200	46,900	52,200	57,000	60,900
Self-employed	30,200	30,500	32,100	36,600	42,100	49,300	50,600	60,300	70,400
Educational institution	19,100	21,400	23,700	26,400	31,100	36,200	40,600	45,900	50,900
Univ./4-Yr college	19,200	21,500	23,800	26,500	31,300	36,300	40,800	46,200	51,200
Other	18,300	19,500	21,400	25,100	28,300	31,700	36,200	40,900	46,200
Federal govt. (civilian)	23,500	26,300	29,700	33,400	40,300	44,700	48,400	50,700	53,900
State/Local govt	19,400	21,500	21,800	23,700	28,300	33,900	36,000	40,300	42,800
Hospitals/Clinics	19,400	21,800	23,600	26,300	31,100	34,700	37,800	40,700	45,100
Other non-profits	21,700	24,400	26,900	30,400	34,900	39,800	43,900	47,000	52,200
Other/No response	21,000	**	37,600	40,600	61,400	61,900	75,400	65,500	65,800
Primary work activity									
Research and development	20,500	23,000	25,600	29,200	35,200	40,500	45,400	50,100	54,500
Basic research	19,900	22,200	24,600	27,700	33,100	37,900	42,400	47,700	51,900
Applied research	20,800	23,400	26,300	30,000	36,000	41,300	46,000	50,200	54,600
Development	20,800	23,600	26,100	30,800	36,500	43,100	48,300	53,600	59,300
Management/Administration	26,000	29,600	31,900	35,000	43,200	50,600	55,700	61,300	66,800
of R&D	26,200	30,100	33,100	35,900	45,800	53,800	60,300	67,400	72,800
of Other	25,700	28,600	30,600	32,600	39,900	45,000	50,900	55,300	60,500
Teaching	18,600	20,600	22,600	25,200	30,100	34,800	39,200	44,000	48,400
Professional services	20,400	21,600	24,200	27,700	33,800	36,900	40,700	47,000	50,800
Rrpt/Stat/Comput activ	3/	3/	3/	3/	3/	3/	3/	46,700	50,600
Consulting	22,500	25,500	28,200	31,500	39,600	46,500	50,600	56,000	60,800
Other/No response	20,900	22,900	25,200	30,600	36,200	40,800	45,800	50,100	56,200

** Median salaries were not computed for groups with fewer than 20 individuals reporting salary.

1/ All doctoral scientists and engineers employed in a science or engineering (S&E) field were categorized by their field of employment when that information was available. When it was not, or when the employment field was other than science or engineering, the doctorate holders were categorized by their field of doctoral degree.
2/ Due to differences in the wording of questionnaires, data collected before 1985 are not comparable to recent data.
3/ This category was first introduced in 1987 to conform to other data series produced by NSF.

NOTES: All numbers in the table are estimates derived from a sample.

Median salaries were computed only for full-time employed civilians.

SOURCE: National Science Foundation/SRS, 1989 Survey of Doctorate Recipients

Table 6. Doctoral scientists and engineers employed in universities and 4-year colleges, by field: 1973-89

Field	1973	1975	1977	1979	1981	1983	1985	1987	1989
Total	124,841	143,615	157,088	167,433	179,224	187,554	202,019	209,384	220,942
SCIENTISTS	111,996	128,863	141,373	150,478	161,247	167,305	180,505	185,746	195,981
Physical scientists	20,830	24,178	25,556	25,973	26,786	26,453	28,206	28,729	28,899
Chemists	11,075	13,150	13,730	14,161	14,521	13,905	15,021	15,104	15,074
Physicists/Astronomers	9,755	11,028	11,826	11,812	12,265	12,548	13,185	13,625	13,825
Mathematical scientists	10,260	11,407	11,781	12,070	12,274	12,770	13,027	13,031	13,588
Mathematicians	9,194	10,094	10,543	10,267	10,555	10,891	11,115	10,989	11,614
Statisticians	1,066	1,313	1,238	1,803	1,719	1,879	1,912	2,042	1,974
Computer/Information spec	1,357	1,711	2,118	2,390	2,954	3,905	5,124	5,439	6,349
Environmental scientists	5,041	5,809	6,120	5,999	6,613	6,519	7,097	7,375	7,825
Earth scientists	4,060	4,473	4,470	4,471	4,837	4,497	4,950	5,011	5,519
Oceanographers	682	779	940	789	987	1,080	1,184	1,303	1,354
Atmospheric scientists	299	557	710	739	789	942	963	1,061	952
Life scientists	37,379	41,536	45,643	50,355	54,437	57,315	61,788	64,738	68,686
Biological scientists	26,081	27,992	29,821	32,008	34,741	36,780	39,194	40,416	43,198
Agricultural scientists	5,490	6,451	6,861	6,806	7,462	8,036	8,466	8,654	8,714
Medical scientists	5,808	7,093	8,961	11,541	12,234	12,499	14,128	15,668	16,774
Psychologists	13,590	16,004	16,572	17,569	19,034	19,377	21,493	22,012	22,930
Social scientists	23,539	28,218	33,583	36,122	39,149	40,966	43,770	44,422	47,704
Economists	6,967	8,139	8,709	8,985	10,427	11,264	11,633	11,654	12,372
Sociologists/Anthropol	5,900	7,167	8,284	8,555	8,975	9,841	10,005	9,905	10,488
Other social scientists	10,672	12,912	16,590	18,582	19,747	19,861	22,132	22,863	24,844
ENGINEERS	12,845	14,752	15,715	16,955	17,977	20,249	21,514	23,638	24,961
Aeronautical/Astron	410	532	561	783	675	865	732	907	1,758
Chemical	1,028	1,186	1,178	1,129	1,380	1,722	1,733	1,939	2,151
Civil	1,679	1,961	2,156	2,681	2,884	3,121	3,407	3,774	3,642
Electrical/Electronic	2,771	3,114	3,251	2,896	3,592	3,959	4,627	3,971	4,816
Materials science	1,206	1,257	1,464	1,614	1,490	1,820	1,819	1,901	2,007
Mechanical	1,602	1,785	2,006	2,195	2,135	2,560	2,906	3,540	3,576
Nuclear	306	516	514	858	634	674	512	514	676
Systems design	569	651	756	913	992	881	775	1,164	1,133
Other	3,274	3,750	3,829	3,886	4,195	4,647	5,003	5,928	5,702

NOTES: All numbers in the table are estimates derived from a sample.

All doctoral scientists and engineers employed in a science or engineering (S&E) field were categorized by their field of employment when that information was available. When it was not, or when the employment field was other than science or engineering, doctorate holders were categorized by their field of degree.

SOURCE: National Science Foundation/SRS, 1989 Survey of Doctorate Recipients

Table 7. Doctoral scientists and engineers employed in universities and 4-year colleges, by demographic characteristics: 1973-89

[Percent distribution]

Characteristics	1973	1975	1977	1979	1981	1983	1985	1987	1989
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Sex									
Men	91.1	90.1	89.0	88.0	86.8	85.6	84.3	83.3	82.0
Women	8.9	9.9	11.0	12.0	13.2	14.4	15.7	16.7	18.0
Race									
White	91.6	91.2	91.2	91.6	91.0	90.7	90.1	89.9	89.6
Asian/Pacific Islander	4.6	4.9	4.8	6.4	6.7	6.7	7.4	7.7	8.0
Black	1.1	1.2	1.1	1.2	1.5	1.7	1.8	1.8	1.8
Native American	.1	.1	.1	.2	.2	.2	.1	.2	.2
Other	.1	.1	.1	**	.1	.1	.1	.1	.1
No response	2.5	2.5	2.7	.6	.5	.7	.6	.4	.4
Ethnicity									
Hispanic	.7	.8	1.0	1.3	1.3	1.4	1.4	1.7	2.0
Non-Hispanic	44.3	47.1	55.4	93.1	94.7	94.2	95.1	96.0	96.3
No response	55.0	52.1	43.6	5.6	3.9	4.4	3.5	2.4	1.7
Age									
Under 30	4.6	3.9	3.4	2.6	2.5	1.8	1.6	1.2	1.2
30-34	22.6	21.0	18.5	16.6	15.1	12.6	12.1	11.3	10.6
35-39	19.4	20.8	22.6	22.8	20.4	18.8	18.2	16.5	1.9
40-44	16.1	15.9	15.9	16.8	19.1	20.7	20.1	18.7	17.7
45-49	13.5	13.3	13.8	13.6	13.2	14.1	15.7	18.3	18.8
50-54	10.5	11.0	11.0	11.1	11.4	11.9	11.5	12.4	12.9
55-59	6.9	7.4	8.0	8.8	9.3	9.6	9.4	10.0	10.5
60-64	4.2	4.4	4.8	5.3	6.0	6.8	7.4	7.5	7.6
65 or over	2.3	2.1	2.1	2.4	3.1	3.6	4.0	4.0	4.7
No response	**	**	.1	**	**	.1	.1	.2	.3
Citizenship									
U.S. total	93.3	94.0	94.0	92.2	93.6	94.0	93.1	92.9	92.5
U.S. native-born	1/	1/	1/	1/	85.3	84.8	83.7	83.1	82.8
U.S. naturalized	1/	1/	1/	1/	8.3	8.8	9.3	9.7	9.6
Non-U.S. total	6.4	5.8	5.8	7.5	6.3	6.0	6.9	7.1	7.5
Non-U.S. perm. resident	1/	1/	1/	1/	4.5	4.7	5.4	5.9	5.9
Non-U.S. temp. resident	1/	1/	1/	1/	1.2	.9	1.3	1.1	1.6
Geographic division									
New England	8.4	8.3	8.3	8.6	8.7	8.9	8.9	8.9	9.2
Middle Atlantic	17.2	17.1	16.1	16.1	16.5	16.3	16.1	15.7	15.6
East North Central	18.4	18.3	18.4	17.5	17.4	17.2	16.4	16.1	17.0
West North Central	8.3	7.8	8.0	7.6	8.0	7.9	7.7	8.1	7.8
South Atlantic	13.7	14.1	13.6	14.3	14.1	14.6	14.7	15.1	15.1
East South Central	5.1	5.2	4.9	5.4	5.4	5.1	5.4	5.2	5.1
West South Central	8.0	7.8	8.3	8.3	8.3	8.6	8.8	8.7	8.5
Mountain	6.5	6.8	7.1	6.8	6.5	6.8	6.9	6.9	6.5
Pacific	14.1	14.3	15.0	15.2	14.8	14.3	14.8	15.0	14.8
Other U.S.	.3	.3	.3	.3	.3	.4	.3	.4	.4
Place of birth									
U.S.	83.0	83.3	84.3	82.1	81.8	81.4	80.9	80.9	80.2
Canada	1.5	1.3	1.2	1.4	1.3	1.2	1.2	1.3	1.3
Latin & South America	.5	.6	.6	.8	.8	1.0	1.0	1.1	1.1
North,Central,West Europe	4.5	4.4	4.1	4.3	4.1	3.9	4.0	3.8	4.0
Eastern Europe	2.1	2.0	1.8	1.9	1.9	1.7	1.7	1.5	1.5
Eastern Asia	2.9	3.1	3.0	3.6	3.9	3.7	4.0	4.1	4.3
Western Asia	2.3	2.2	2.0	2.9	3.1	3.4	3.9	4.0	4.1
Australasia 2/	.4	.4	.4	.5	.4	.4	.4	.6	.5
Africa	.4	.5	.5	.7	.7	.9	.9	.9	1.0
No response	2.5	2.3	2.1	1.9	1.9	2.2	2.0	1.9	2.0

** Less than 0.05 percent

1/ Data were not collected before 1981 on U.S. native-born or naturalized citizens or on non-U.S. permanent or temporary residents.

2/ Australasia comprises Australia, New Zealand, Indonesia, and the Phillipines.

NOTE: All numbers in the table are estimates derived from a sample.

SOURCE: National Science Foundation/SRS, 1989 Survey of Doctorate Recipients

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Table 8. Doctoral scientists and engineers employed in universities and 4-year colleges, by employment-related characteristics: 1973-89

[Percent distribution]

Characteristics	1973	1975	1977	1979	1981	1983	1985	1987	1989
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Type of employment									
Science/Engineering	94.7	94.6	93.4	93.0	92.9	90.1	93.3	91.8	92.2
Other/Unknown field	5.3	5.4	6.6	7.0	7.1	9.9	6.7	8.2	7.8
Primary work activity									
Research and development	24.5	24.8	27.0	27.9	29.3	29.1	30.0	35.0	36.0
Basic research	18.0	17.6	19.1	19.9	21.1	21.0	21.6	23.1	23.8
Applied research	6.1	6.6	7.0	7.4	7.6	7.2	7.7	11.5	11.8
Development	.5	.5	.9	.6	.6	.8	.7	.4	.4
Management/Administration	10.3	10.2	12.3	15.0	9.9	10.4	11.2	10.6	10.7
of R&D	3.6	3.5	3.9	4.9	2.4	1.6	1.9	1.9	1.7
of Other	6.7	6.7	8.4	10.1	7.4	8.8	9.3	8.7	9.0
Teaching	61.0	60.3	54.3	52.0	55.4	53.6	51.3	48.6	47.5
Professional services	1.0	1.3	1.6	1.7	2.1	2.2	2.3	2.4	2.5
Rprt/Stat/Comput activ	1/	1/	1/	1/	1/	1/	1/	.8	.8
Consulting	.3	.3	.5	.5	.4	.4	.6	.2	.3
Other/No response	2.9	3.1	4.3	2.9	2.2	4.4	4.6	2.4	2.2
Federal support									
Receiving support	45.5	42.9	41.7	40.2	37.1	41.4	33.2	47.9	49.0
Not receiving support	49.5	53.4	54.0	56.0	46.0	48.7	50.9	48.5	48.4
Status unknown/No response	5.0	3.7	4.3	3.8	16.9	9.9	15.9	3.6	2.6
Area of national interest									
Education	2/	2/	2/	2/	2/	2/	2/	40.6	36.9
Health	2/	2/	2/	2/	2/	2/	2/	18.7	18.8
National defense	2/	2/	2/	2/	2/	2/	2/	2.8	2.7
Environment	2/	2/	2/	2/	2/	2/	2/	5.3	5.1
Space	2/	2/	2/	2/	2/	2/	2/	1.2	1.1
Communications	2/	2/	2/	2/	2/	2/	2/	1.5	1.6
Agriculture	2/	2/	2/	2/	2/	2/	2/	6.1	5.5
Energy of fuel	2/	2/	2/	2/	2/	2/	2/	3.3	3.2
Mineral resources	2/	2/	2/	2/	2/	2/	2/	.4	.4
Biotechnology	2/	2/	2/	2/	2/	2/	2/	2.8	2.9
Community dev./services	2/	2/	2/	2/	2/	2/	2/	1.1	1.3
Housing	2/	2/	2/	2/	2/	2/	2/	.2	.2
Transportation	2/	2/	2/	2/	2/	2/	2/	.5	.6
Other	2/	2/	2/	2/	2/	2/	2/	11.1	11.7
No response	2/	2/	2/	2/	2/	2/	2/	4.4	8.1
Academic rank									
Professor	37.6	37.0	36.6	38.6	39.9	41.2	39.4	41.0	40.8
Associate professor	27.0	26.7	26.7	25.0	25.1	25.7	24.2	24.1	22.9
Assistant professor	23.6	22.1	21.9	20.4	18.9	17.4	18.1	17.4	17.5
Instructor	.7	.8	1.0	.9	1.0	.6	1.1	.9	.8
Lecturer	.7	.8	1.1	3/	3/	3/	3/	1.1	1.2
Adjunct	3/	3/	3/	3/	3/	3/	3/	1.5	1.8
Tenure status									
Tenured	22.7	57.5	59.0	59.7	61.0	61.9	59.1	55.9	55.1
Not tenured	16.4	33.1	34.1	37.4	35.8	28.7	34.1	24.3	24.6
In tenure track	3/	3/	3/	16.3	16.9	15.0	17.0	15.4	15.2
Not in tenure track	3/	3/	3/	13.2	15.2	10.0	16.5	8.9	9.4

1/ This category was first introduced in 1987 to conform to other data series produced by NSF.
2/ Due to differences in categories offered, data collected before 1987 are not comparable to recent data.
3/ Not available.

NOTE: All numbers in the table are estimates derived from a sample.

SOURCE: National Science Foundation/SRS, 1989 Survey of Doctorate Recipients

Table 9. Median annual salaries of doctoral scientists and engineers employed in universities and 4-year colleges, by demographic characteristics and field of degree: 1973-89

Characteristics	1973	1975	1977	1979	1981	1983	1985	1987	1989
Total	$19,200	$21,500	$23,800	$26,500	$31,300	$36,300	$40,800	$46,200	$51,200
Sex									
Men	19,500	21,900	24,200	27,100	32,200	37,000	42,100	48,000	53,100
Women	16,700	18,400	20,000	22,200	25,600	30,100	33,800	37,800	42,200
Race									
White	19,200	21,500	23,900	26,600	31,400	36,400	40,800	46,500	51,300
Asian/Pacific Islander	18,200	20,600	22,600	25,500	30,800	35,100	41,100	45,900	51,300
Black	19,700	21,800	22,200	24,300	30,300	34,500	38,200	41,000	45,700
Native American	**	18,800	22,900	26,200	28,700	35,100	40,100	46,000	48,400
Other	**	**	24,400	**	**	**	36,800	46,700	46,300
Ethnicity									
Hispanic	17,900	20,700	21,400	24,600	27,800	33,100	37,600	42,200	44,900
Non-Hispanic	19,400	21,400	23,100	26,500	31,300	36,400	40,800	46,300	51,300
Age									
Under 30	14,500	15,800	17,500	19,100	22,300	26,900	31,300	37,000	44,300
30-34	15,900	17,500	18,700	20,600	24,000	27,200	30,600	35,100	38,400
35-39	18,200	19,800	21,700	23,900	27,600	30,900	34,600	38,000	42,000
40-44	20,200	22,400	24,600	27,600	31,500	36,100	40,100	42,900	47,300
45-49	22,500	24,600	26,700	29,600	34,700	40,200	43,800	48,700	54,600
50-54	23,700	26,400	29,500	31,700	36,600	40,800	46,500	52,000	58,800
55-59	24,000	26,400	30,000	33,500	39,200	44,000	48,400	55,400	59,900
60-64	24,800	26,900	30,400	34,000	39,800	45,900	50,600	57,100	61,300
65 or over	24,200	27,300	30,700	35,500	40,700	46,100	51,000	58,900	67,000
Citizenship									
U.S. total	19,300	21,500	23,900	26,600	31,400	36,500	40,900	46,400	51,400
U.S. native-born	1/	1/	1/	1/	31,000	36,300	40,500	45,700	50,700
U.S. naturalized	1/	1/	1/	1/	35,000	40,700	45,800	52,100	58,300
Non-U.S. total	18,000	20,700	22,400	25,000	29,900	33,000	39,500	44,400	48,800
Non-U.S. perm. resident	1/	1/	1/	1/	30,000	33,900	39,500	45,500	50,500
Non-U.S. temp. resident	1/	1/	1/	1/	26,300	28,800	38,300	36,000	36,800
Geographic division									
New England	19,200	21,200	23,200	25,400	29,500	36,500	40,400	46,400	53,100
Middle Atlantic	20,400	22,700	24,700	26,800	31,200	36,500	41,900	48,100	52,900
East North Central	19,600	21,500	24,100	26,800	31,900	36,500	40,900	47,300	51,100
West North Central	18,600	20,600	22,800	26,300	30,100	34,900	39,000	42,100	47,400
South Atlantic	19,400	21,100	23,000	26,600	31,100	35,700	40,400	45,900	51,500
East South Central	18,000	19,800	22,200	25,500	29,900	33,900	39,000	42,900	46,700
West South Central	18,300	21,000	23,400	25,800	30,400	36,400	39,600	42,500	47,300
Mountain	18,700	20,900	24,300	27,600	32,600	38,400	42,100	46,800	51,400
Pacific	19,200	22,300	24,900	26,800	34,100	37,800	44,400	50,500	55,700
Other U.S.	17,300	19,500	20,000	23,800	24,700	27,300	27,200	29,500	33,400
Field of degree									
SCIENTISTS	18,900	21,100	23,400	26,100	30,700	35,700	40,000	45,100	50,100
Physical scientists	18,700	21,700	24,100	27,200	32,800	38,400	42,600	49,400	54,700
Chemists	18,300	21,000	23,500	26,400	31,500	36,300	40,600	47,500	51,000
Physicists/Astronomers	19,300	22,400	24,700	28,000	34,300	40,600	45,900	52,500	58,500
Mathematical scientists	18,700	20,800	23,000	25,500	30,500	36,000	40,700	47,200	51,800
Mathematicians	18,500	20,500	22,800	25,200	30,400	35,700	40,400	46,600	51,500
Statisticians	21,200	23,700	26,000	29,800	32,500	37,600	45,200	49,200	58,400
Computer/Information spec.	18,600	19,600	22,300	24,500	29,600	37,300	44,600	50,500	55,800
Envlronmental scientists	18,800	20,800	23,500	26,200	30,700	36,400	40,200	45,200	50,200
Earth scientists	18,800	21,000	23,500	26,500	31,300	36,800	40,500	45,700	49,700
Oceanographers	17,900	18,800	22,900	24,300	26,800	31,400	37,400	43,500	50,900
Atmospheric scientists	20,900	23,400	26,500	24,800	30,200	37,400	41,100	40,900	52,300
Life scientists	18,800	20,900	23,500	26,400	30,900	35,500	39,700	44,000	48,600
Biological scientists	18,800	20,700	23,000	25,700	30,600	35,200	39,300	43,700	48,800
Agricultural scientists	18,400	20,500	23,200	26,700	30,700	35,400	39,300	42,300	45,800
Medical scientists	20,800	23,400	25,900	30,100	34,100	36,900	40,800	46,100	50,400
Psychologists	19,000	20,600	22,500	25,100	28,900	33,300	36,900	41,800	46,800
Social scientists	19,400	21,300	23,300	25,600	30,000	34,700	39,100	44,000	48,800
Economists	20,700	22,800	25,200	28,800	33,500	37,900	42,900	48,400	55,000
Sociologists/Anthropol	19,100	20,600	22,200	24,000	28,800	32,800	37,300	41,900	46,100
Other social scientists	18,600	20,300	22,500	24,800	29,100	33,500	37,000	42,400	47,700
ENGINEERS	20,400	23,300	26,300	29,700	36,100	42,200	48,500	55,200	61,200
Aeronautical/Astron	20,000	22,300	26,600	28,800	34,600	45,600	53,500	61,100	62,800
Chemical	21,200	24,900	28,400	29,600	37,600	44,200	48,800	53,600	56,100
Civil	20,200	22,700	26,100	27,800	34,300	40,900	48,000	52,700	60,700
Electrical/Electronic	20,600	23,900	26,600	30,900	36,300	43,100	50,400	62,800	70,700
Materials science	21,600	24,300	27,900	30,800	40,000	44,500	52,100	58,600	63,800
Mechanical	20,400	23,000	26,100	29,100	39,000	44,400	47,700	55,000	59,700
Nuclear	19,100	23,500	27,000	**	**	41,800	52,900	62,600	65,200
Systems design	19,900	21,500	23,900	26,600	34,800	44,300	50,300	56,000	61,700
Other	19,900	22,600	25,200	29,500	35,700	39,800	44,800	51,400	56,500
OTHER FIELDS	20,300	22,600	24,500	26,500	30,500	37,200	40,100	43,100	46,900

** Median salaries were not computed for groups with fewer than 20 individuals reporting salary.

1/ Data were not collected before 1981 on U.S. native-born or naturalized citizens or on non-U.S. permanent or temporary residents.

NOTES: All numbers in the table are estimates derived from a sample.

Median salaries were computed only for full-time employed civilians.

SOURCE: National Science Foundation/SRS, 1989 Survey of Doctorate Recipients

Table 10. Median annual salaries of doctoral scientists and engineers employed in universities and 4-year colleges, by employment-related characteristics: 1973-89

Characteristics	1973	1975	1977	1979	1981	1983	1985	1987	1989
Total	$19,200	$21,500	$23,800	$26,500	$31,300	$36,300	$40,800	$46,200	$51,200
Field 1/									
SCIENTISTS	18,900	21,100	23,400	26,000	30,700	35,700	40,000	45,000	50,000
Physical Scientists	18,500	21,400	23,800	26,800	32,000	37,700	41,700	48,300	52,600
Chemists	18,000	20,800	23,000	25,800	31,000	35,900	39,700	46,000	48,600
Physicists/Astronomers	19,100	22,200	24,600	27,900	33,700	40,300	45,700	52,000	56,400
Mathematical scientists	18,600	20,600	22,800	25,600	30,600	35,800	40,600	45,900	51,200
Mathematicians	18,500	20,400	22,700	25,500	30,600	35,700	40,600	46,200	51,100
Statisticians	19,800	22,200	23,500	27,200	31,000	36,300	42,200	45,000	51,400
Computer/Information spec	21,200	22,700	24,400	25,800	30,700	37,400	44,000	50,000	55,300
Envlronmental scientists	18,900	21,200	23,700	26,800	31,300	36,400	40,900	45,400	50,700
Earth scientists	18,700	21,100	23,500	26,800	31,800	36,800	41,200	47,700	50,600
Oceanographers	19,100	19,900	23,600	26,700	28,300	31,800	39,700	39,900	52,000
Atmospheric scientists	21,900	23,400	25,400	27,300	31,500	34,700	45,500	42,800	48,000
Life scientists	18,900	21,000	23,600	26,400	31,000	35,700	40,000	44,500	49,000
Biological scientists	18,600	20,500	22,900	25,200	30,000	34,800	38,800	42,900	48,500
Agricultural scientists	18,600	20,700	23,400	27,200	30,900	35,800	39,400	44,100	46,600
Medical scientists	21,200	24,100	25,900	30,100	35,400	39,100	43,500	48,100	51,500
Psychologists	19,000	20,900	22,700	25,300	29,100	33,600	37,400	41,900	46,800
Social scientists	19,500	21,200	23,400	25,500	29,900	34,600	39,000	44,000	48,800
Economists	20,500	22,600	25,100	28,600	33,400	37,500	42,500	48,100	54,700
Sociologists/Anthropol	19,100	20,500	22,100	23,900	28,500	31,900	37,400	41,900	46,200
Other social scientists	18,800	20,400	22,700	24,900	29,200	33,900	37,100	42,600	47,900
ENGINEERS	20,600	23,600	26,500	30,000	36,500	42,500	48,600	55,500	61,600
Aeronautical/Astron	21,800	24,100	26,900	28,700	36,800	44,600	53,100	62,600	63,500
Chemical	21,600	24,700	28,000	30,900	40,000	41,700	48,100	53,700	58,300
Civil	20,000	22,600	25,500	27,900	34,100	40,800	47,100	53,100	59,500
Electrical/Electronic	20,600	23,800	27,100	31,600	38,200	43,300	49,700	58,400	64,400
Materials science	21,400	24,500	28,600	30,400	39,700	44,600	51,500	61,500	63,800
Mechanical	20,600	22,700	26,100	29,300	36,800	43,300	46,900	55,200	60,000
Nuclear	21,000	24,700	27,700	32,500	36,800	46,100	52,900	62,700	68,100
Systems design	20,300	23,800	26,700	28,900	36,300	44,200	50,200	62,200	67,800
Other	20,400	23,400	26,300	29,600	35,600	41,100	48,400	51,800	59,600
Years of prof. Experience									
Less than 5	2/	2/	2/	2/	2/	2/	29,500	34,000	36,600
5-9	2/	2/	2/	2/	2/	2/	33,800	37,600	41,900
10-14	2/	2/	2/	2/	2/	2/	39,400	43,800	48,500
15-19	2/	2/	2/	2/	2/	2/	44,900	49,800	54,600
20-24	2/	2/	2/	2/	2/	2/	48,400	54,700	61,300
25-29	2/	2/	2/	2/	2/	2/	50,800	57,900	64,000
30-34	2/	2/	2/	2/	2/	2/	55,500	61,500	66,700
35 or more	2/	2/	2/	2/	2/	2/	58,600	67,000	75,400
Primary work activity									
Research and development	18,800	21,200	23,700	26,400	31,600	36,700	41,400	47,500	52,400
Basic research	18,700	20,900	23,400	26,300	31,100	36,200	40,800	47,300	52,100
Applied research	18,900	21,500	24,200	26,800	32,500	37,300	42,600	47,500	52,800
Development	18,500	22,600	22,300	25,500	31,800	40,500	43,500	58,000	57,800
Management/Administration	24,900	27,900	30,300	31,700	39,800	45,600	50,800	57,700	63,800
of R&D	23,900	28,100	30,500	32,300	42,600	50,700	56,300	65,300	67,100
of Other	25,200	27,800	30,200	31,500	39,200	44,500	50,300	55,700	63,000
Teaching	18,700	20,600	22,700	25,300	30,200	34,900	39,300	44,300	48,600
Professional services	17,500	19,200	22,000	26,600	30,900	32,300	38,700	41,500	47,000
Rprt/Stat/Comput activ	3/	3/	3/	3/	3/	3/	3/	45,100	45,200
Consulting	18,700	23,500	24,100	26,300	32,700	37,900	38,500	45,100	45,800
Other/No response	20,400	21,600	24,200	28,300	33,900	36,800	44,100	41,700	47,700
Academic Rank									
Professor	24,300	26,500	30,000	33,300	38,600	44,200	49,000	56,100	62,700
Associate professor	18,500	20,300	22,700	25,100	29,600	33,800	37,500	42,300	47,500
Assistant professor	15,500	17,100	18,600	20,600	24,000	27,800	31,100	35,600	39,300
Instructor	13,200	14,400	15,700	18,400	20,500	24,100	25,800	28,500	30,600
Lecturer	15,400	16,600	18,000	4/	4/	4/	4/	37,100	38,900
Adjunct	4/	4/	4/	4/	4/	4/	4/	35,900	42,100
Tenure status									
Tenured	20,800	23,800	26,000	29,500	34,400	39,700	44,700	50,500	56,400
Not tenured	15,600	17,700	19,000	21,400	25,000	29,300	33,000	36,500	40,600
In tenure track	4/	4/	4/	21,000	24,700	29,000	33,200	36,700	40,800
Not in tenure track	4/	4/	4/	22,000	25,400	29,400	32,400	35,900	40,000

1/ All doctoral scientists and engineers employed in a science or engineering (S&E) field were categorized by their field of employment when that information was available. When it was not, or when the employment field was other than science or engineering, the doctorate holders were categorized by their field of doctoral degree.
2/ Due to differences in the wording of the questionnaire, data collected before 1985 are not comparable to recent data.
3/ This category was first introduced in 1987 to conform to other data series produced by NSF.
4/ Not available.

NOTES: All numbers in the table are estimates derived from a sample.

Median salaries were computed only for full-time employed civilians.

SOURCE: National Science Foundation/SRS, 1989 Survey of Doctorate Recipients

Table 11. Labor force participation rates of doctoral scientists and engineers, by demographic characteristics: 1973-89

Characteristics	1973	1975	1977	1979	1981	1983	1985	1987	1989
Total	93.3%	95.6%	94.8%	95.3%	95.2%	94.4%	95.1%	93.8%	93.3%
Sex									
Men	94.2	96.3	95.4	95.9	95.7	94.8	95.4	94.1	93.3
Women	84.4	89.1	89.9	90.4	91.8	91.8	93.1	92.8	92.9
Race									
White	93.5	95.6	94.7	95.1	95.0	94.1	94.8	93.4	92.8
Asian/Pacific Islander	96.9	98.7	98.5	98.1	97.5	97.3	98.2	98.2	97.4
Black	93.5	96.5	96.9	94.4	95.0	95.6	97.5	97.0	97.6
Native American	85.4	98.6	100.0	98.3	96.4	95.9	96.2	96.2	95.0
Other	93.6	100.0	94.6	100.0	100.0	98.6	100.0	96.3	89.2
Ethnicity									
Hispanic	92.6	95.9	96.0	97.9	97.2	96.2	96.7	97.4	96.0
Non-Hispanic	95.3	97.0	95.8	96.0	95.4	94.4	95.1	93.8	93.2
Age									
Under 30	97.0	97.9	96.4	96.5	97.5	95.5	98.4	96.9	99.2
30-34	96.7	98.2	98.0	97.5	98.2	97.8	98.2	98.4	98.4
35-39	97.4	98.9	98.3	98.7	98.6	98.1	98.8	98.7	98.5
40-44	97.0	99.3	98.6	99.2	99.2	98.0	99.0	98.6	98.7
45-49	96.8	99.2	98.6	98.9	98.6	98.2	99.2	99.0	99.1
50-54	96.2	98.6	97.6	98.6	98.5	97.8	98.6	98.4	98.9
55-59	94.3	97.1	95.6	97.2	96.5	95.9	96.7	95.8	96.1
60-64	86.4	90.5	88.5	87.5	88.8	89.7	89.9	85.5	86.2
65 or over	41.0	43.1	42.7	48.7	51.0	51.3	53.3	48.6	48.3
Citizenship									
U.S. total	93.3	95.5	94.7	95.1	95.0	94.2	94.9	93.6	93.0
U.S. native-born	1/	1/	1/	1/	94.9	94.1	94.8	93.4	92.8
U.S. naturalized	1/	1/	1/	1/	96.0	95.5	95.6	94.7	94.1
Non-U.S. total	96.6	98.7	98.2	97.8	98.2	97.9	98.9	98.3	97.9
NON-U.S. perm. resident	1/	1/	1/	1/	98.1	98.3	98.7	98.2	97.9
NON-U.S. temp. resident	1/	1/	1/	1/	98.3	95.3	99.9	98.7	98.2
Geographic division									
New England	93.2	95.4	94.7	95.5	95.7	94.9	96.0	94.8	94.9
Middle Atlantic	93.3	96.3	95.1	95.7	95.6	94.5	95.2	94.4	93.8
East North Central	94.0	95.8	95.4	96.5	95.9	95.6	95.9	94.9	94.3
West North Central	93.8	95.7	95.4	96.5	95.9	94.9	95.1	93.4	93.0
South Atlantic	91.9	94.4	93.8	94.3	93.9	93.4	94.2	92.5	92.4
East South Central	94.9	96.4	96.7	96.4	95.7	94.2	96.3	94.0	92.5
West South Central	94.7	97.1	95.4	95.2	95.9	95.7	95.9	94.0	93.9
Mountain	93.6	94.6	93.7	93.4	93.6	93.0	93.4	92.4	90.3
Pacific	92.8	95.3	94.7	94.7	95.1	94.0	94.8	94.0	93.0
Other U.S.	89.5	94.3	88.2	93.0	93.5	94.2	94.7	94.6	95.3
Field 2/									
SCIENTISTS	92.7	95.1	94.4	94.8	94.7	93.9	94.6	93.5	92.7
Physical scientists	93.1	94.8	93.8	94.5	94.0	93.1	93.2	91.9	90.4
Chemists	92.2	94.2	92.9	93.6	93.2	92.0	91.9	90.8	89.5
Physicists/Astronomers	94.7	95.8	95.5	96.2	95.8	95.3	95.6	93.9	92.3
Mathematical scientists	94.1	96.6	95.9	95.7	95.2	95.0	96.3	94.8	94.2
Mathematicians	93.7	96.3	95.6	95.3	95.0	94.6	96.0	94.8	94.1
Statisticians	97.2	98.8	98.3	97.7	96.6	96.7	98.0	95.0	94.8
Computer/Information spec.	98.5	99.9	99.1	99.7	99.9	98.9	99.9	99.8	99.4
Environmental scientists	95.4	97.8	96.7	97.1	97.2	96.7	96.8	94.7	94.2
Earth scientists	95.3	97.6	96.4	96.5	96.9	96.3	96.1	93.8	93.7
Oceanographers	95.7	99.3	99.3	99.3	98.1	98.2	99.7	97.3	95.0
Atmospheric scientists	96.7	98.2	96.2	98.7	98.2	97.6	98.2	98.0	96.9
Life scientists	92.1	93.7	93.1	93.9	93.5	92.7	93.7	92.7	91.9
Biological scientists	91.8	93.0	92.1	93.2	92.9	92.2	93.4	91.7	91.1
Agricultural scientists	92.5	95.6	94.9	93.9	92.1	91.7	92.9	90.0	88.0
Medical scientists	92.7	94.5	94.4	95.7	95.7	94.7	95.1	96.3	95.9
Psychologists	92.5	96.6	95.7	95.4	96.2	94.9	95.9	95.6	94.5
Social scientists	91.3	94.9	94.6	94.6	94.5	94.1	94.4	92.4	92.4
Economists	90.3	93.8	93.3	94.0	93.8	94.1	94.2	91.7	91.2
Sociologists/Anthropol	91.8	94.8	94.2	94.3	93.7	92.1	93.0	90.4	90.5
Other social scientists	91.8	95.6	95.5	94.9	95.1	94.9	95.1	93.6	93.7
ENGINEERS	96.7	98.2	97.3	98.0	97.8	96.9	97.5	95.9	96.0
Aeronautical/Astron	98.3	98.1	95.6	95.8	99.3	99.0	99.9	97.1	98.9
Chemical	93.9	97.0	96.2	93.1	94.1	92.7	94.5	91.4	91.3
Civil	97.6	99.2	98.9	99.0	97.7	96.6	96.1	93.7	95.6
Electrical/Electronic	97.2	98.4	97.5	99.2	98.5	97.3	98.3	96.2	96.3
Materials science	96.0	97.0	97.3	99.4	98.2	97.7	97.9	96.5	96.3
Mechanical	97.7	98.9	96.6	97.4	96.3	96.3	97.2	96.3	95.3
Nuclear	99.6	100.0	97.8	100.0	100.0	100.0	100.0	100.0	99.6
Systems design	97.4	99.6	99.2	99.9	99.9	98.2	100.0	99.8	99.6
Other engineers	96.6	98.0	97.2	98.1	98.4	97.3	97.2	96.4	96.0

1/ Data were not collected before 1981 on U.S. native-born or naturalized citizens or on non-U.S. permanent or temporary residents.

2/ All doctoral scientists and engineers employed in a science or engineering (S&E) field were categorized by their field of employment when that information was available. When it was not, or when the employment field was other than science or engineering, the doctorate holders were categorized by their field of doctoral degree.

NOTE: All numbers in the table are estimates derived from a sample.

SOURCE: National Science Foundation/SRS, 1989 Survey of Doctorate Recipients

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Table 12. Unemployment rates of doctoral scientists and engineers, by demographic characteristics: 1973-89

Characteristics	1973	1975	1977	1979	1981	1983	1985	1987	1989
Total	1.1%	1.0%	1.2%	.9%	.8%	1.0%	.8%	1.1%	.8%
Sex									
Men	.9	.8	.9	.7	.6	.7	.7	.9	.6
Women	3.8	2.9	3.4	2.7	2.4	2.5	1.8	2.0	1.7
Race									
White	1.1	.9	1.1	.9	.7	.9	.8	1.0	.8
Asian/Pacific Islander	1.8	1.6	1.5	1.1	.9	1.1	.9	1.3	.7
Black	**	1.0	.8	2.9	1.5	1.9	1.2	2.0	3.7
Native American	3.4	**	2.9	**	**	1.6	.4	2.9	1.5
Other	4.4	4.0	7.9	11.5	3.2	**	7.4	3.4	1.1
Ethnicity									
Hispanic	1.6	.5	1.1	.8	1.4	1.3	1.5	.9	.8
Non-Hispanic	1.0	.9	1.1	.9	.8	.9	.8	1.0	.8
Age									
Under 30	1.7	1.0	.8	1.8	.1	.6	.7	.3	1.3
30-34	1.3	1.2	1.4	1.1	1.1	1.0	.8	.8	.9
35-39	.9	.8	1.3	.7	.8	1.4	.7	1.0	.9
40-44	.9	.9	1.1	.7	.8	.9	.9	.9	.8
45-49	1.1	1.1	1.2	1.0	.5	.9	.9	1.0	.8
50-54	1.0	.9	.7	.9	1.0	.8	.8	1.5	.9
55-59	1.7	1.0	1.0	.9	.5	1.2	1.1	1.4	.6
60-64	.6	.7	1.1	1.1	.4	.7	1.1	1.7	.7
65 or over	1.4	.2	1.0	.9	1.0	.4	.3	.6	.8
Citizenship									
U.S. total	1.1	.9	1.1	.9	.8	1.0	.8	1.1	.8
U.S. native-born	1/	1/	1/	1/	.7	.9	.8	1.0	.8
U.S. naturalized	1/	1/	1/	1/	.9	1.2	1.0	1.3	1.1
NON-U.S. total	1.5	1.5	1.4	1.5	1.0	1.2	1.0	1.1	1.0
NON-U.S. perm. resident	1/	1/	1/	1/	1.3	1.4	1.0	1.0	1.0
NON-U.S. temp. resident	1/	1/	1/	1/	**	.8	.7	1.3	1.1
Geographic division									
New England	1.2	1.3	1.2	.9	.4	1.0	1.2	.9	.7
Middle Atlantic	1.2	1.1	1.2	1.1	.9	1.6	1.0	1.2	.7
East North Central	1.1	.8	.9	.7	.7	.9	1.0	1.1	.7
West North Central	1.1	.6	.7	.6	.3	.9	.7	.7	.6
South Atlantic	1.0	.7	1.0	.8	.7	.8	.5	.7	.8
East South Central	.7	.2	.3	.8	.8	.5	.2	.6	.5
West South Central	.8	.6	.9	.7	.5	.6	.4	1.1	.6
Mountain	1.5	.9	1.2	.7	1.1	.9	1.1	.9	1.0
Pacific	1.4	1.6	2.0	1.5	1.2	1.0	1.2	1.7	1.3
Other U.S.	**	**	**	**	.2	.4	.2	**	.4
Field 2/									
SCIENTISTS	1.2	1.0	1.3	1.0	.9	1.1	.9	1.2	.9
Physical scientists	1.8	1.4	1.4	1.2	.8	1.2	.9	1.4	.8
Chemists	1.9	1.2	1.4	1.2	.8	1.4	1.1	1.6	.6
Physicists/Astronomers	1.7	1.9	1.4	1.2	.8	.9	.4	1.0	1.3
Mathematical scientists	1.4	.7	1.2	.4	.6	.6	.5	1.0	.5
Mathematicians	1.5	.8	1.3	.5	.7	.7	.5	1.0	.5
Statisticians	.3	.1	.2	**	.2	**	.5	.7	.6
Computer/Information spec	**	.1	**	**	.1	**	**	.1	**
Environmental scientists	1.0	.8	.9	.3	.4	.6	.6	.9	.7
Earth scientists	1.1	.6	.8	.3	.5	.5	.5	1.2	.8
Oceanographers	1.2	1.9	2.2	.7	.1	1.4	1.1	.1	.5
Atmospheric scientists	**	.7	**	.2	**	.5	1.2	.1	**
Life scientists	.9	1.0	1.3	1.0	1.2	1.3	1.1	1.4	.8
Biological scientists	1.3	1.5	1.8	1.4	1.8	1.7	1.5	1.7	1.1
Agricultural scientists	.6	.3	.6	.8	.6	1.0	1.0	1.6	.7
Medical scientists	.2	.2	.5	.4	.3	.5	.4	.5	.3
Psychologists	1.0	.7	1.2	1.1	1.1	1.1	.9	.7	1.0
Social scientists	1.0	1.0	1.3	1.1	.8	1.1	1.0	1.4	1.3
Economists	.6	.4	.4	.4	.3	.5	.2	.6	.8
Sociologists/Anthropol	1.4	1.8	2.6	2.1	1.6	2.5	2.1	2.8	2.9
Other social scientists	1.0	1.0	1.3	1.1	.7	.9	1.0	1.2	.9
ENGINEERS	.7	.7	.6	.5	.1	.4	.5	.6	.7
Aeronautical/Astron	.1	**	1.7	**	**	.1	.5	.9	**
Chemical	1.0	1.1	1.1	.3	.2	2.3	1.8	.9	1.6
Civil	.5	.4	.6	**	**	**	.8	.1	2.0
Electrical/Electronic	.7	.8	.1	1.4	**	.3	.6	1.3	.2
Materials science	1.2	.9	.7	.3	**	**	.2	.3	1.8
Mechanical	1.2	.8	.3	.7	**	.8	**	.9	.1
Nuclear	**	.6	.6	**	**	.1	**	**	**
Systems design	.1	**	.2	1.2	.1	**	.3	.3	.3
Other	.7	.5	.6	**	.2	.2	.3	.4	.1
Years of prof. experience									
Less than 5	3/	3/	3/	3/	3/	3/	1.7	1.7	1.9
5-9	3/	3/	3/	3/	3/	3/	.8	1.1	.7
10-14	3/	3/	3/	3/	3/	3/	.9	1.1	.8
15-19	3/	3/	3/	3/	3/	3/	.3	.8	.7
20-24	3/	3/	3/	3/	3/	3/	.6	.7	.4
25-29	3/	3/	3/	3/	3/	3/	.6	.6	.4
30-34	3/	3/	3/	3/	3/	3/	.2	.5	.6
35 or more	3/	3/	3/	3/	3/	3/	**	.1	.1

** Less than 0.05 percent

1/ Data were not collected before 1981 on U.S. native-born or naturalized citizens or on non-U.S. permanent or temporary residents.

2/ All doctoral scientists and engineers employed in a science or engineering (S&E) field were categorized by their field of employment when that information was available. When it was not, or when the employment field was other than science or engineering, the doctorate holders were categorized by their field of doctoral degree.

3/ Due to differences in the wording of questionnaires, data collected before 1985 are not comparable to recent data.

NOTE: All numbers in the table are estimates derived from a sample.

SOURCE: National Science Foundation/SRS, 1989 Survey of Doctorate Recipients

Table 13. Science and engineering employment rates of doctoral scientists and engineers, by demographic characteristics: 1973-89

Characteristics	1973	1975	1977	1979	1981	1983	1985	1987	1989
Total	93.6%	93.9%	91.9%	91.7%	91.4%	88.6%	91.6%	90.3%	90.4%
Sex									
Men	93.8	93.9	92.0	91.9	91.7	88.9	91.8	90.8	90.8
Women	92.0	92.9	90.8	90.1	89.7	87.1	90.3	88.1	88.7
Race									
White	93.6	93.8	91.9	91.6	91.5	88.7	91.4	90.2	90.3
Asian/Pacific Islander	95.8	96.4	93.9	93.9	92.6	90.8	95.1	93.1	93.3
Black	87.7	86.5	85.6	87.4	85.7	80.1	85.9	84.9	82.0
Native American	97.2	95.3	93.2	89.9	88.9	95.7	90.7	94.5	95.2
Other	80.6	81.5	93.2	82.1	67.4	84.8	92.0	77.5	75.8
Ethnicity									
Hispanic	94.7	94.3	90.5	93.2	90.1	87.5	92.7	90.9	90.9
Non-Hispanic	94.3	94.8	92.6	91.9	91.4	89.4	91.6	90.4	90.5
Age									
Under 30	97.1	95.8	96.0	97.8	97.4	96.8	98.4	95.8	95.9
30-34	95.9	95.5	95.2	95.3	94.9	92.4	97.2	95.6	94.8
35-39	94.6	94.9	93.3	92.7	93.1	90.4	93.5	92.2	93.2
40-44	93.8	94.2	92.4	91.7	91.2	88.0	90.5	89.8	90.8
45-49	92.7	93.7	91.7	91.5	90.8	86.9	90.1	88.9	88.8
50-54	91.2	92.9	89.3	90.1	90.9	87.5	90.5	89.1	88.3
55-59	90.9	91.0	87.6	88.9	88.4	87.0	89.6	89.1	88.8
60-64	89.6	90.2	86.2	85.1	85.7	86.6	88.8	88.1	90.9
65 or over	87.8	84.6	80.5	82.8	82.8	81.9	86.1	84.9	84.0
Citizenship									
U.S. total	93.5	93.7	91.7	91.5	91.4	88.6	91.3	90.1	90.3
U.S. native-born	1/	1/	1/	1/	91.5	88.6	91.1	90.0	90.2
U.S. naturalized	1/	1/	1/	1/	90.9	89.5	92.5	90.7	91.2
Non-U.S. total	96.2	96.6	94.3	95.4	92.2	88.7	96.8	93.7	92.9
Non-U.S. perm. resident	1/	1/	1/	1/	93.0	90.1	96.8	93.6	92.8
Non-U.S. temp. resident	1/	1/	1/	1/	89.7	88.0	96.5	93.8	94.7
Geographic division									
New England	92.7	93.4	90.9	91.6	92.3	89.4	92.9	90.8	90.8
Middle Atlantic	92.8	93.8	91.3	91.1	91.0	87.8	91.1	90.1	88.9
East North Central	93.8	93.9	92.4	91.5	91.8	89.2	92.1	90.0	91.0
West North Central	93.4	93.9	91.8	91.7	92.3	90.2	92.1	92.0	91.1
South Atlantic	93.3	93.9	91.5	91.5	91.1	88.6	91.4	91.1	91.7
East South Central	95.3	94.9	92.2	92.4	91.6	91.6	92.7	90.5	91.7
West South Central	93.7	94.2	92.3	93.7	92.1	89.4	92.6	90.8	91.4
Mountain	94.6	93.6	93.4	91.3	92.6	89.0	92.1	90.6	91.9
Pacific	94.7	93.9	92.3	92.0	90.6	87.0	90.3	89.1	88.9
Other U.S.	88.8	87.5	90.2	91.1	82.3	79.5	83.4	78.8	77.5
Field 2/									
SCIENTISTS	93.3	93.5	91.4	91.3	91.1	88.1	91.2	89.8	89.9
Physical scientists	91.1	91.6	89.2	90.3	90.4	88.1	91.0	90.6	90.3
Chemists	89.9	91.0	89.1	90.6	90.8	89.4	91.4	90.7	90.2
Physicists/Astronomers	93.1	92.7	89.4	89.6	89.8	85.7	90.3	90.6	90.5
Mathematical scientists	96.7	94.4	93.2	92.5	90.6	87.2	92.5	90.1	90.9
Mathematicians	96.5	93.8	92.9	91.6	90.0	86.2	91.7	89.0	89.8
Statisticians	97.5	98.2	95.3	97.4	93.6	92.1	96.5	95.5	96.8
Computer/Information spec	99.2	99.1	98.6	99.0	99.1	98.6	99.3	99.2	98.7
Environmental scientists	97.5	97.3	96.7	96.7	96.3	95.0	96.4	96.1	96.1
Earth scientists	97.4	96.8	96.2	96.3	95.9	94.7	96.2	96.1	95.9
Oceanographers	97.0	99.3	98.3	97.8	97.5	97.1	95.9	96.4	96.3
Atmospheric scientists	99.8	99.1	98.0	97.9	97.5	95.4	98.2	96.1	97.3
Life scientists	95.9	96.3	94.7	95.0	95.1	92.6	95.6	93.6	93.8
Biological scientists	95.5	95.5	93.7	93.8	94.2	91.5	93.9	92.8	92.5
Agricultural scientists	95.6	96.1	95.2	94.7	93.6	92.4	95.3	94.1	95.3
Medical scientists	97.6	98.3	96.8	97.9	97.9	95.2	99.5	95.2	95.7
Psychologists	94.3	95.3	93.1	92.5	91.9	89.4	92.1	90.4	90.3
Social scientists	87.4	87.6	84.9	83.1	82.5	76.4	80.1	77.8	78.5
Economists	85.5	85.9	84.6	83.1	82.6	79.0	82.7	82.7	81.9
Sociologists/Anthropol	91.7	93.7	90.9	85.2	82.5	78.7	81.1	75.7	76.4
Other social scientists	86.8	86.0	82.7	82.3	82.5	74.0	78.3	76.1	77.6
ENGINEERS	95.4	95.8	94.2	93.7	93.2	91.3	93.6	93.0	93.0
Aeronautical/Astron	93.2	96.0	93.9	90.6	89.0	91.1	94.6	96.4	97.4
Chemical	92.5	93.6	91.2	92.2	89.1	86.6	88.1	89.2	89.5
Civil	96.5	94.7	94.2	90.4	90.7	93.7	93.0	91.5	90.4
Electrical/Electronic	95.7	96.3	94.4	93.5	94.5	90.1	95.1	92.4	94.6
Materials science	94.6	94.1	95.5	94.9	93.5	94.4	94.9	95.8	94.7
Mechanical	95.0	96.3	92.3	94.0	92.7	90.3	92.4	93.4	91.5
Nuclear	98.3	100.0	97.5	94.2	95.5	96.0	92.3	95.7	93.2
Systems design	97.5	98.8	97.2	98.5	96.9	93.0	91.7	91.2	89.6
Other	96.5	96.2	94.4	93.9	94.7	91.3	95.4	93.2	93.2
Years of prof. experience									
Less than 5	3/	3/	3/	3/	3/	3/	94.2	91.8	91.9
5-9	3/	3/	3/	3/	3/	3/	92.1	91.0	91.9
10-14	3/	3/	3/	3/	3/	3/	91.8	89.7	89.8
15-19	3/	3/	3/	3/	3/	3/	91.5	90.5	89.2
20-24	3/	3/	3/	3/	3/	3/	91.7	90.7	90.9
25-29	3/	3/	3/	3/	3/	3/	89.1	89.1	90.6
30-34	3/	3/	3/	3/	3/	3/	90.8	90.4	89.7
35 or more	3/	3/	3/	3/	3/	3/	88.3	89.8	92.1

1/ Data were not collected before 1981 on U.S. native-born or naturalized citizens or on non-U.S. permanent or temporary residents.

2/ All doctoral scientists and engineers employed in a science or engineering (S&E) field were categorized by their field of employment when that information was available. When it was not, or when the employment field was other than science or engineering, the doctorate holders were categorized by their field of doctoral degree.

3/ Due to differences in the wording of questionnaires, data collected before 1985 are not comparable to recent data.

NOTE: All numbers in the table are estimates derived from a sample.

SOURCE: National Science Foundation/SRS, 1989 Survey of Doctorate Recipients

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Table 14. Underemployment rates of doctoral scientists and engineers, by demographic characteristics: 1973-89

Characteristics	1973	1975	1977	1979	1981	1983	1985	1987	1989
Total	1.1%	.9%	1.2%	1.1%	.9%	1.5%	1.3%	1.3%	1.3%
Sex									
Men	.9	.7	.9	.8	.6	1.1	1.0	1.0	1.0
Women	4.0	2.7	4.2	3.3	2.9	3.8	3.1	3.3	2.6
Race									
White	1.1	.9	1.3	1.1	.9	1.5	1.3	1.4	1.3
Asian/Pacific Islander	1.2	.9	.9	.7	.7	.9	1.6	.8	.9
Black	1.6	.4	1.4	1.7	.9	2.9	2.7	2.3	2.9
Native American	**	**	1.3	**	**	.5	1.1	1.1	1.6
Other	**	.4	1.1	2.4	**	**	1.6	.8	8.9
Ethnicity									
Hispanic	2.1	.6	.9	1.1	.9	1.2	1.5	1.1	1.4
Non-Hispanic	1.0	.9	1.4	1.0	.9	1.5	1.3	1.3	1.3
Age									
Under 30	1.6	1.4	2.6	1.0	1.3	1.3	.3	1.4	1.3
30-34	1.2	1.2	1.4	1.1	1.4	1.2	1.4	1.0	1.4
35-39	1.1	.8	1.4	1.3	.8	1.7	1.5	1.6	1.1
40-44	.9	.6	1.2	1.0	.9	1.4	1.1	1.4	1.4
45-49	.9	.8	.8	1.1	.8	1.3	1.4	1.5	1.4
50-54	1.1	.9	1.1	.8	.6	2.0	1.3	1.0	1.3
55-59	1.2	1.0	1.0	1.0	.8	1.1	1.4	1.4	1.1
60-64	1.2	.7	.9	.8	1.0	1.0	1.2	1.1	1.5
65 or over	2.4	1.0	1.2	1.3	.9	1.6	.9	.8	1.2
Citizenship									
U.S. total	1.1	.9	1.2	1.1	.9	1.5	1.3	1.3	1.3
U.S. native-born	1/	1/	1/	1/	.9	1.5	1.3	1.4	1.4
U.S. naturalized	1/	1/	1/	1/	.8	1.4	1.3	1.1	.9
Non-U.S. total	.9	.8	1.1	.6	.9	.6	1.4	1.2	1.0
Non-U.S. perm. resident	1/	1/	1/	1/	1.2	.7	1.7	1.4	1.1
Non-U.S. temp. resident	1/	1/	1/	1/	**	.1	.5	.6	.9
Geographic division									
New England	1.8	1.0	1.3	1.4	1.0	1.6	1.4	1.5	1.2
Middle Atlantic	1.3	1.2	1.3	1.0	.9	1.6	1.3	1.4	1.1
East North Central	.7	1.0	.9	.9	.6	1.1	1.2	.8	1.2
West North Central	.9	.5	.7	.5	.8	.9	.5	1.3	1.0
South Atlantic	.8	.5	.9	.8	.7	.9	1.0	.7	.9
East South Central	.6	.6	1.1	.4	.6	.5	1.4	1.1	1.4
West South Central	.9	.7	.8	.9	.3	1.7	1.0	1.0	.7
Mountain	1.5	1.0	1.4	1.2	.8	1.8	1.7	1.0	1.8
Pacific	1.6	1.2	2.1	1.9	1.8	2.5	2.0	2.5	2.1
Other U.S.	1.3	3.6	**	**	.7	**	1.8	.7	4.3
Field 2/									
SCIENTISTS	1.2	1.0	1.4	1.2	1.0	1.6	1.4	1.5	1.4
Physical scientists	1.5	1.2	1.1	.9	.6	1.1	.6	.7	.7
Chemists	1.5	1.1	1.1	.9	.6	1.1	.8	.7	.6
Physicists/Astronomers	1.6	1.5	1.2	.9	.7	1.1	.8	.9	.8
Mathematical scientists	.6	1.1	1.6	1.0	.4	.9	.3	.4	.7
Mathematicians	.6	1.2	1.7	1.1	.5	1.0	.6	.4	.8
Statisticians	.5	.4	.7	.2	**	.6	.7	.6	*
Computer/Information spec	.6	.9	.3	.1	1.8	1.0	.5	.8	1.0
Environmental scientists	1.2	.8	.8	.8	.8	1.4	.9	.9	1.7
Earth scientists	1.2	.9	.7	.8	.7	1.3	1.0	1.0	1.5
Oceanographers	1.8	.9	1.2	.2	1.6	1.8	.6	.4	3.9
Atmospheric scientists	.2	**	1.1	1.3	.8	1.5	.5	.4	.1
Life scientists	.9	.7	.9	.9	.7	1.0	1.0	1.3	1.0
Biological scientists	1.0	.8	1.1	1.0	1.0	1.0	1.2	1.5	1.2
Agricultural scientists	.6	.6	.5	.7	.2	.3	.7	.6	1.0
Medical scientists	1.0	.6	.5	.7	.3	1.3	.8	1.2	.8
Psychologists	1.2	1.0	1.9	1.6	1.5	2.3	1.7	1.6	1.9
Social scientists	1.5	1.2	2.4	2.1	1.7	2.8	3.3	3.2	2.8
Economists	.7	.4	.7	.5	.3	.3	1.5	.3	.7
Sociologists/Anthropol	1.4	1.2	2.0	3.5	2.7	4.1	6.5	7.5	5.4
Other social scientists	2.2	1.9	3.5	2.3	2.1	3.6	3.1	3.0	2.8
ENGINEERS	.7	.5	.5	.4	.3	.8	.7	.5	.6
Aeronautical/Astron	.7	**	**	1.9	**	1.6	1.2	**	.2
Chemical	.6	.3	**	**	**	.4	**	1.2	.5
Civil	1.0	.2	.2	**	.4	.4	.8	.1	.7
Electrical/Electronic	.3	.5	1.0	1.1	**	.8	**	**	.5
Materials science	1.9	.7	.7	**	**	1.7	.7	**	.1
Mechanical	.6	.3	.6	**	**	.3	1.2	.1	.7
Nuclear	.9	**	**	**	**	**	**	**	.3
Systems design	1.4	.3	.1	.3	**	.8	1.5	**	.7
Other	.3	.9	.6	.5	1.1	.7	1.1	1.4	.9
Years of professional experience									
Less than 5	3/	3/	3/	3/	3/	3/	3.5	3.2	2.8
5-9	3/	3/	3/	3/	3/	3/	1.5	1.6	1.4
10-14	3/	3/	3/	3/	3/	3/	1.0	1.0	1.2
15-19	3/	3/	3/	3/	3/	3/	.8	.7	.8
20-24	3/	3/	3/	3/	3/	3/	.7	.5	.5
25-29	3/	3/	3/	3/	3/	3/	.5	.4	.8
30-34	3/	3/	3/	3/	3/	3/	.6	.6	.6
35 or more	3/	3/	3/	3/	3/	3/	.5	.4	.6

** Less than 0.05 percent

1/ Data were not collected before 1981 on U.S. native-born or naturalized citizens or on non-U.S. permanent or temporary residents.

2/ All doctoral scientists and engineers employed in a science or engineering (S&E) field were categorized by their field of employment when that information was available. When it was not, or when the employment field was other than science or engineering, the doctorate holders were categorized by their field of doctoral degree.

3/ Due to differences in the wording of questionnaires, data collected before 1985 are not comparable to recent data.

NOTE: All numbers in the table are estimates derived from a sample.

SOURCE: National Science Foundation/SRS, 1989 Survey of Doctorate Recipients

Table 15. Underutilization rates of doctoral scientists and engineers, by demographic characteristics: 1973-89

Characteristics	1973	1975	1977	1979	1981	1983	1985	1987	1989
Total	2.2%	1.9%	2.4%	2.0%	1.7%	2.4%	2.1%	2.4%	2.1%
Sex									
Men	1.8	1.5	1.8	1.5	1.2	1.8	1.7	1.8	1.7
Women	7.6	5.6	7.5	6.0	5.2	6.2	4.9	5.3	4.3
Race									
White	2.2	1.8	2.4	2.0	1.7	2.4	2.1	2.4	2.1
Asian/Pacific Islander	3.0	2.4	2.4	1.8	1.6	2.0	2.5	2.1	1.6
Black	1.6	1.4	2.2	4.6	2.4	4.8	3.8	4.3	6.5
Native American	3.4	**	4.1	**	**	2.1	1.5	4.0	3.1
Other	4.4	4.3	8.9	13.7	3.2	**	8.9	4.2	9.9
Ethnicity									
Hispanic	3.7	1.1	2.1	1.8	2.3	2.5	3.0	2.0	2.2
Non-Hispanic	2.1	1.8	2.5	1.9	1.7	2.4	2.1	2.4	2.1
Age									
Under 30	3.3	2.4	3.4	2.8	1.4	1.8	1.0	1.6	2.5
30-34	2.4	2.4	2.8	2.2	2.5	2.1	2.2	1.8	2.2
35-39	2.0	1.6	2.7	2.0	1.6	3.1	2.2	2.6	2.0
40-44	1.8	1.4	2.2	1.7	1.7	2.3	2.0	2.4	2.2
45-49	2.0	1.9	2.0	2.1	1.3	2.1	2.3	2.4	2.2
50-54	2.1	1.8	1.8	1.7	1.7	2.8	2.1	2.5	2.2
55-59	2.9	2.0	2.0	2.0	1.3	2.3	2.5	2.8	1.6
60-64	1.8	1.5	2.0	1.9	1.4	1.8	2.3	2.8	2.1
65 or over	3.8	1.2	2.2	2.2	1.8	2.1	1.2	1.3	2.0
Citizenship									
U.S. total	2.2	1.8	2.4	2.0	1.7	2.5	2.1	2.4	2.1
U.S. native-born	1/	1/	1/	1/	1.7	2.4	2.1	2.4	2.2
U.S. naturalized	1/	1/	1/	1/	1.6	2.5	2.3	2.4	1.9
Non-U.S. total	2.4	2.3	2.5	2.1	1.8	1.9	2.4	2.3	2.0
Non-U.S. perm. resident	1/	1/	1/	1/	2.4	2.1	2.7	2.4	2.0
Non-U.S. temp. resident	1/	1/	1/	1/	**	.9	1.3	1.9	2.0
Geographic division									
New England	2.9	2.3	2.4	2.3	1.4	2.6	2.6	2.4	1.9
Middle Atlantic	2.5	2.3	2.5	2.1	1.7	3.1	2.3	2.6	1.8
East North Central	1.8	1.8	1.9	1.6	1.2	1.9	2.1	1.9	1.9
West North Central	2.0	1.1	1.4	1.2	1.1	1.7	1.2	2.0	1.6
South Atlantic	1.8	1.3	1.9	1.6	1.5	1.7	1.4	1.4	1.7
East South Central	1.3	.7	1.4	1.2	1.4	.9	1.6	1.7	1.9
West South Central	1.6	1.3	1.8	1.5	.7	2.3	1.5	2.1	1.4
Mountain	3.0	1.8	2.6	1.9	1.9	2.5	2.7	2.3	2.8
Pacific	3.0	2.8	4.1	3.4	3.0	3.5	3.1	4.1	3.5
Other U.S.	1.3	3.6	**	**	.9	.4	2.1	.7	4.7
Field 2/									
SCIENTISTS	2.4	2.0	2.6	2.2	1.9	2.7	2.3	2.6	2.3
Physical scientists	3.3	2.6	2.5	2.1	1.4	2.3	1.5	2.1	1.5
Chemists	3.3	2.2	2.5	2.2	1.4	2.5	1.9	2.3	1.2
Physicists/Astronomers	3.2	3.3	2.4	2.1	1.5	2.0	.8	1.8	2.1
Mathematical scientists	2.0	1.8	2.8	1.4	1.0	1.6	1.1	1.4	1.2
Mathematicians	2.1	2.0	3.0	1.6	1.2	1.8	1.2	1.4	1.3
Statisticians	.9	.5	.9	.2	.2	.6	.5	1.3	.6
Computer/Information spec	.6	1.0	.3	.1	1.8	1.0	.5	.9	1.0
Environmental scientists	2.2	1.6	1.6	1.1	1.2	2.0	1.5	1.8	2.3
Earth scientists	2.2	1.6	1.5	1.1	1.2	1.8	1.5	2.2	2.3
Oceanographers	3.0	2.8	3.4	.9	1.7	3.2	1.6	.5	4.4
Atmospheric scientists	.2	.7	1.1	1.4	.8	1.9	1.7	.5	.1
Life scientists	1.9	1.7	2.2	1.9	1.9	2.3	2.1	2.6	1.8
Biological scientists	2.2	2.3	2.9	2.4	2.8	2.8	2.6	3.2	2.3
Agricultural scientists	1.2	.9	1.1	1.5	.8	1.3	1.6	2.2	1.7
Medical scientists	1.2	.8	1.0	1.1	.6	1.8	1.2	1.7	1.1
Psychologists	2.2	1.7	3.1	2.7	2.6	3.4	2.6	2.3	2.9
Social scientists	2.5	2.2	3.7	3.2	2.5	3.9	4.3	4.5	4.0
Economists	1.3	.8	1.1	.9	.6	.8	1.6	.9	1.5
Sociologists/Anthropol	2.8	3.0	4.5	5.5	4.3	6.5	8.4	10.0	8.2
Other social scientists	3.2	2.8	4.8	3.4	2.8	4.5	4.1	4.2	3.7
ENGINEERS	1.5	1.1	1.1	.9	.4	1.2	1.2	1.1	1.2
Aeronautical/Astron	.8	.1	1.7	1.9	**	1.7	1.7	.9	.2
Chemical	1.6	1.5	1.1	.3	.2	2.7	1.8	2.1	2.2
Civil	1.5	.6	.9	**	.4	.4	1.5	.2	2.7
Electrical/Electronic	1.0	1.3	1.1	2.5	**	1.1	.6	1.3	.6
Materials science	3.1	1.6	1.4	.4	**	1.7	.9	.3	2.0
Mechanical	1.8	1.0	.8	.7	**	1.1	1.2	1.1	.8
Nuclear	.9	.6	.6	**	**	.1	**	**	.3
Systems design	1.5	.3	.3	1.5	.1	.8	1.8	.3	1.0
Other	1.0	1.4	1.2	.5	1.4	.8	1.5	1.8	1.0
Years of prof. experience									
Less than 5	3/	3/	3/	3/	3/	3/	5.2	4.9	4.7
5-9	3/	3/	3/	3/	3/	3/	2.3	2.7	2.2
10-14	3/	3/	3/	3/	3/	3/	1.9	2.1	2.0
15-19	3/	3/	3/	3/	3/	3/	1.2	1.5	1.5
20-24	3/	3/	3/	3/	3/	3/	1.3	1.2	.9
25-29	3/	3/	3/	3/	3/	3/	1.1	1.0	1.3
30-34	3/	3/	3/	3/	3/	3/	.8	1.1	1.2
35 or more	3/	3/	3/	3/	3/	3/	.5	.4	.7

** Less than 0.05 percent

1/ Data were not collected before 1981 on U.S. native-born or naturalized citizens or on non-U.S. permanent or temporary residents.

2/ All doctoral scientists and engineers employed in a science or engineering (S&E) field were categorized by their field of employment when that information was available. When it was not, or when the employment field was other than science or engineering, the doctorate holders were categorized by their field of doctoral degree.

3/ Due to differences in the wording of the questionnaries, data collected before 1985 are not comparable to recent data.

NOTE: All numbers in the table are estimates derived from a sample.

SOURCE: National Science Foundation/SRS, 1989 Survey of Doctorate Recipients

Table 16. Employed doctoral scientists and engineers, by field and citizenship status: 1989

Field	Citizenship						
		U.S.			Non-U.S.		
	Total 1/	Total	Native	Natlzd	Total	Perm res	Temp res
Total	448,643	420,457	372,486	47,905	28,133	22,576	5,299
SCIENTISTS	373,860	353,409	320,372	33,013	20,415	16,452	3,911
Physical scientists	70,209	64,802	56,507	8,295	5,407	4,162	1,233
Chemists	45,649	42,643	36,870	5,773	3,006	2,394	603
Physicists/Astronomers	24,560	22,159	19,637	2,522	2,401	1,768	630
Mathematical scientists	17,611	15,924	13,715	2,209	1,687	1,251	436
Mathematicians	14,867	13,539	11,864	1,675	1,328	989	339
Statisticians	2,744	2,385	1,851	534	359	262	97
Computer/Information spec	19,797	18,045	15,744	2,301	1,752	1,524	228
Environmental scientists	19,787	18,426	16,581	1,845	1,361	1,151	179
Earth scientists	15,138	14,098	12,650	1,448	1,040	906	117
Oceanographers	2,460	2,375	2,246	129	85	53	32
Atmospheric scientists	2,189	1,953	1,685	268	236	192	30
Life scientists	115,833	110,329	99,941	10,373	5,504	4,343	1,161
Biological scientists	67,250	63,818	57,766	6,044	3,432	2,538	894
Agricultural scientists	16,304	15,907	14,856	1,051	597	457	140
Medical scientists	32,079	30,604	27,319	3,278	1,475	1,348	127
Psychologists	60,596	59,630	57,267	2,361	938	835	94
Social scientists	70,027	66,253	60,617	5,629	3,766	3,186	580
Economists	18,588	16,893	15,212	1,681	1,687	1,405	282
Sociologists/Anthropol	13,529	12,949	12,206	740	580	534	46
Other social scientists	37,910	36,411	33,199	3,208	1,499	1,247	252
ENGINEERS	74,783	67,048	52,114	14,892	7,718	6,124	1,388
Aeronautical/Astron	6,367	5,933	4,554	1,379	434	361	73
Chemical	7,959	7,151	5,541	1,610	808	620	119
Civil	6,951	6,184	4,642	1,542	767	617	148
Electrical/Electronic	15,088	13,103	9,770	3,333	1,968	1,616	344
Materials science	8,280	7,206	5,660	1,546	1,074	751	208
Mechanical	7,390	6,672	5,118	1,554	718	514	192
Nuclear	2,437	2,201	1,795	406	236	208	28
Systems design	3,896	3,618	2,880	738	278	254	24
Other	16,415	14,980	12,154	2,784	1,435	1,183	252

1/ Total(s) include(s) individuals for whom citizenship was unspecified and from whom no response was received.

NOTES: All numbers in the table are estimates derived from a sample.

All doctoral scientists and engineers employed in a science or engineering (S&E) field were categorized by their field of employment when that information was available. When it was not or when the employment field was other than science or engineering, doctorate holders were categorized by their field of degree.

SOURCE: National Science Foundation/SRS, 1989 Survey of Doctorate Recipients

Table 17. Employed doctoral scientists and engineers, by field and employment sector: 1989

Field	Total 1/ employed	Education		Business/Industry			Government		Non-profit 2/
		Total	Univ./ 4-yr coll	Total	Not self-emp	Self-emp	Federal civilian	State/ Local	
Total	448,643	230,932	220,942	145,148	112,671	32,477	29,242	10,397	28,847
SCIENTISTS	373,860	205,810	195,981	103,189	74,233	28,956	24,696	9,858	26,653
Physical scientists	70,209	30,276	28,899	32,042	30,382	1,660	4,602	424	2,573
Chemists	45,649	16,100	15,074	25,799	24,512	1,287	2,173	348	1,070
Physicists/Astronomers	24,560	14,176	13,825	6,243	5,870	373	2,429	76	1,503
Mathematical scientists	17,611	14,300	13,588	2,105	1,671	434	786	53	285
Mathematicians	14,867	12,313	11,614	1,685	1,285	400	505	39	253
Statisticians	2,744	1,987	1,974	420	386	34	281	24	32
Computer/Information spec	19,797	6,553	6,349	11,483	10,393	1,090	820	308	602
Environmental scientists	19,787	8,001	7,825	6,266	5,410	856	3,264	1,131	894
Earth scientists	15,138	5,690	5,519	5,628	4,910	718	2,226	1,010	442
Oceanographers	2,460	1,359	1,354	285	225	60	453	79	274
Atmospheric scientists	2,189	952	952	353	275	78	585	42	178
Life scientists	115,833	70,479	68,686	23,572	18,363	5,209	9,132	2,743	8,566
Biological scientists	67,250	44,585	43,198	11,446	9,905	1,541	5,266	1,441	3,987
Agricultural scientists	16,504	8,926	8,714	4,220	3,270	950	2,409	361	449
Medical scientists	32,079	16,968	16,774	7,906	5,188	2,718	1,457	941	4,130
Psychologists	60,596	26,425	22,930	19,899	3,535	16,364	1,426	2,211	10,251
Social scientists	70,027	49,776	47,704	7,822	4,479	3,343	4,666	2,978	3,482
Economists	18,588	12,497	12,372	2,606	1,926	680	1,530	413	668
Sociologists/Anthropol	13,529	11,171	10,488	1,240	691	549	170	177	676
Other social scientists	37,910	26,108	24,844	3,976	1,862	2,114	2,966	2,388	2,138
ENGINEERS	74,783	25,122	24,961	41,959	38,438	3,521	4,546	539	2,194
Aeronautical/Astron	6,367	1,258	1,258	4,116	3,929	187	715	**	248
Chemical	7,959	2,152	2,151	5,411	5,133	278	246	14	127
Civil	6,951	3,667	3,642	2,426	1,870	556	432	302	73
Electrical/Electronic	15,088	4,829	4,816	8,780	8,301	479	950	50	377
Materials science	8,280	2,007	2,007	5,526	5,210	316	473	33	234
Mechanical	7,390	3,597	3,576	3,129	2,831	298	364	7	230
Nuclear	2,437	680	676	1,395	1,304	91	89	**	266
Systems design	3,896	1,133	1,133	2,269	2,094	175	195	25	258
Other	16,415	5,799	5,702	8,907	7,766	1,141	1,082	108	381

** No cases reported (see NOTES below)

1/ Totals include individuals who work in employment sectors other than education, business/industry, government, and nonprofit organizations; they also include individuals form whom no response was received.
2/ "Nonprofit" [organizations] include hospitals and clinics.

NOTES: All numbers in the table are estimates derived from a sample.

All doctoral scientists and engineers employed in a science or engineering (S&E) field were categorized by their field of employment when that information was available. When it was not or when the employment field was other than science or engineering, doctorate holders were categorized by their field of degree.

SOURCE: National Science Foundation/SRS, 1989 Survey of Doctorate Recipients

Table 18. Employed doctoral scientists and engineers, by field and primary work activity: 1989

Field	Total employed	Research & Development				Management/Admin			Teaching	Prof. serv.	Consulting	Other/ No resp
		Total	Basic	App'd	Devlop/ Design	Total	of R&D	of Other				
Total	448,643	166,601	67,687	77,872	21,042	73,486	35,414	38,072	112,715	36,599	16,767	42,475
SCIENTISTS	373,860	132,660	64,112	59,200	9,348	57,592	24,354	33,238	99,972	36,467	11,549	35,620
Physical scientists	70,209	35,677	13,047	18,799	3,831	12,042	8,493	3,549	14,492	531	1,245	6,222
Chemists	45,649	22,320	6,179	13,278	2,863	8,502	6,245	2,257	8,906	278	943	4,700
Physicists/Astronomers	24,560	13,357	6,868	5,521	968	3,540	2,248	1,292	5,586	253	302	1,522
Mathematical scientists	17,611	4,441	3,090	1,151	200	1,358	264	1,094	9,758	46	328	1,680
Mathematicians	14,867	3,877	2,710	986	181	1,222	223	999	8,428	46	255	1,039
Statisticians	2,744	564	380	165	19	136	41	95	1,330	**	73	641
Computer/Information spec	19,797	6,591	1,463	2,195	2,933	3,995	2,368	1,627	3,559	37	884	4,731
Environmental scientists	19,787	8,730	3,924	4,553	253	3,776	2,141	1,635	3,447	74	1,785	1,975
Earth scientists	15,138	5,790	2,432	3,209	149	2,818	1,463	1,355	2,978	74	1,697	1,781
Oceanographers	2,460	1,376	861	505	10	596	404	192	281	**	67	140
Atmospheric scientists	2,189	1,564	631	839	94	362	274	88	188	**	21	54
Life scientists	115,833	56,860	33,640	21,637	1,583	17,441	8,036	9,405	21,998	7,057	2,657	9,820
Biological scientists	67,250	38,601	27,944	9,818	839	7,736	3,820	3,916	14,611	746	1,114	4,442
Agricultural scientists	16,504	8,268	1,237	6,688	343	2,858	1,705	1,153	2,121	209	752	2,296
Medical scientists	32,079	9,991	4,459	5,131	401	6,847	2,511	4,336	5,266	6,102	791	3,082
Psychologists	60,596	6,953	3,290	3,347	316	7,004	898	6,106	13,455	28,090	2,239	2,855
Social scientists	70,027	13,408	5,658	7,518	232	11,976	2,154	9,822	33,263	632	2,411	8,337
Economists	18,588	4,743	1,614	3,020	109	2,827	554	2,273	7,774	126	944	2,174
Sociologists/Anthropol	13,529	2,340	1,401	911	28	1,656	167	1,489	7,979	166	351	1,037
Other social scientists	37,910	6,325	2,643	3,587	95	7,493	1,433	6,060	17,510	340	1,116	5,126
ENGINEERS	74,783	33,941	3,575	18,672	11,694	15,894	11,060	4,834	12,743	132	5,218	6,855
Aeronautical/Astron	6,367	3,229	358	1,489	1,382	1,578	1,408	170	631	**	365	564
Chemical	7,959	4,701	491	2,955	1,255	1,322	894	428	843	**	375	718
Civil	6,951	1,449	300	913	236	986	231	755	2,439	78	1,461	538
Electrical/Electronic	15,088	6,736	743	2,708	3,285	3,916	3,102	814	2,808	**	424	1,204
Materials science	8,280	4,549	448	2,966	1,135	1,401	1,164	237	970	3	301	1,056
Mechanical	7,390	3,163	251	1,713	1,199	1,109	707	402	2,387	41	304	386
Nuclear	2,437	1,173	17	750	406	567	340	227	105	**	259	333
Systems design	3,896	1,724	251	687	786	1,026	728	298	378	**	402	366
Other	16,415	7,217	716	4,491	2,010	3,989	2,486	1,503	2,182	10	1,327	1,690

** No cases reported (see NOTES below)

NOTES: All numbers in the table are estimates derived from a sample.

All doctoral scientists and engineers employed in a science or engineering (S&E) field were categorized by their field of employment when that information was available. When it was not or when the employment field was other than science or engineering, doctorate holders were categorized by their field of degree.

SOURCE: National Science Foundation/SRS, 1989 Survey of Doctorate Recipients

Table 19. Employed doctoral scientists and engineers, by field, race/ethnicity, and sex: 1989

Field	Total 1/			White			Asian/Pacific Islander		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Total	448,643	371,483	77,160	397,623	328,542	69,081	41,239	35,911	5,328
SCIENTISTS	373,860	299,015	74,845	338,409	271,100	67,309	26,618	21,772	4,846
Physical scientists	70,209	64,139	6,070	61,624	56,680	4,944	7,217	6,230	987
Chemists	45,649	40,742	4,907	39,519	35,508	4,011	5,119	4,341	778
Physicists/Astronomers	24,560	23,397	1,163	22,105	21,172	933	2,098	1,889	209
Mathematical scientists	17,611	15,766	1,845	15,663	14,116	1,547	1,676	1,422	254
Mathematicians	14,867	13,342	1,525	13,473	12,167	1,306	1,171	990	181
Statisticians	2,744	2,424	320	2,190	1,949	241	505	432	73
Computer/Information spec	19,797	17,493	2,304	17,070	15,033	2,037	2,422	2,174	248
Environmental scientists	19,787	18,123	1,664	18,178	16,612	1,566	1,338	1,252	86
Earth scientists	15,138	13,863	1,275	13,839	12,626	1,213	1,042	992	50
Oceanographers	2,460	2,191	269	2,318	2,067	251	135	117	18
Atmospheric scientists	2,189	2,069	120	2,021	1,919	102	161	143	18
Life scientists	115,833	89,558	26,275	104,302	81,056	23,246	9,298	7,069	2,229
Biological scientists	67,250	51,540	15,710	60,458	46,623	13,835	5,670	4,184	1,486
Agricultural scientists	16,504	15,283	1,221	15,320	14,236	1,084	972	874	98
Medical scientists	32,079	22,735	9,344	28,524	20,197	8,327	2,656	2,011	645
Psychologists	60,596	38,754	21,842	57,961	37,470	20,491	947	490	457
Social scientists	70,027	55,182	14,845	63,611	50,133	13,478	3,720	3,135	585
Economists	18,588	16,294	2,294	16,800	14,747	2,053	1,358	1,184	174
Sociologists/Anthropol	13,529	9,403	4,126	12,567	8,744	3,823	447	324	123
Other social scientists	37,910	29,485	8,425	34,244	26,642	7,602	1,915	1,627	288
ENGINEERS	74,783	72,468	2,315	59,214	57,442	1,772	14,621	14,139	482
Aeronautical/Astron	6,367	6,156	211	4,803	4,647	156	1,395	1,345	50
Chemical	7,959	7,744	215	6,004	5,827	177	1,899	1,865	34
Civil	6,951	6,762	189	5,552	5,393	159	1,303	1,276	27
Electrical/Electronic	15,088	14,651	437	11,646	11,378	268	3,248	3,093	155
Materials science	8,280	7,892	388	6,254	5,956	298	1,936	1,869	67
Mechanical	7,390	7,287	103	5,814	5,731	83	1,510	1,490	20
Nuclear	2,437	2,403	34	1,995	1,975	20	416	406	10
Systems design	3,896	3,703	193	3,474	3,310	164	364	335	29
Other	16,415	15,870	545	13,672	13,225	447	2,550	2,460	90

(Cont.) Field	Black			Native American			Hispanic 2/		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Total	7,190	4,954	2,236	772	589	183	8,094	6,412	1,682
SCIENTISTS	6,572	4,370	2,202	690	520	170	6,820	5,201	1,619
Physical scientists	831	734	97	155	136	19	1,158	963	195
Chemists	657	571	86	81	72	9	720	555	165
Physicists/Astronomers	174	163	11	74	64	10	438	408	30
Mathematical scientists	198	160	38	7	5	2	322	292	30
Mathematicians	163	129	34	4	2	2	271	250	21
Statisticians	35	31	4	3	3	**	51	42	9
Computer/Information spec	191	173	18	18	17	1	351	327	24
Environmental scientists	228	223	5	23	21	2	319	292	27
Earth scientists	218	213	5	21	19	2	192	174	18
Oceanographers	5	5	**	**	**	**	60	56	4
Atmospheric scientists	5	5	**	2	2	**	67	62	5
Life scientists	1,645	993	652	181	112	69	1,907	1,465	442
Biological scientists	851	544	307	61	35	26	1,128	849	279
Agricultural scientists	158	130	28	31	24	7	284	249	35
Medical scientists	636	319	317	89	53	36	495	367	128
Psychologists	1,364	590	774	137	91	46	1,276	746	530
Social scientists	2,115	1,497	618	169	138	31	1,487	1,116	371
Economists	340	273	67	70	70	**	428	344	84
Sociologists/Anthropol	363	232	131	40	24	16	360	252	108
Other social scientists	1,412	992	420	59	44	15	699	520	179
ENGINEERS	618	584	34	82	69	13	1,274	1,211	63
Aeronautical/Astron	165	160	5	2	2	**	40	40	**
Chemical	39	35	4	4	4	**	141	134	7
Civil	79	77	2	4	4	**	108	104	4
Electrical/Electronic	118	110	8	31	31	**	314	302	12
Materials science	46	34	12	14	3	11	45	30	15
Mechanical	16	16	**	10	10	**	104	102	2
Nuclear	7	7	**	**	**	**	100	100	**
Systems design	42	42	**	10	10	**	178	178	**
Other	106	103	3	7	5	2	244	221	23

** No cases reported (see NOTES below)

1/ Totals include individuals whose race was specified as "other" and individuals from whom no response was received.

2/ Individuals who are included in the ethnic category "Hispanic" also may have been included in one of the race categories.

NOTES: All numbers in the table are estimates derived from a sample.

All doctoral scientists and engineers employed in a science or engineering (S&E) field were categorized by their field of employment when that information was available. When it was not, or when the employment field was other than science or engineering, doctorate holders were categorized by their field of degree.

SOURCE: National Science Foundation/SRS, 1989 Survey of Doctorate Recipients

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Table 20. Employed doctoral scientists and engineers, by demographic characteristics and broad field: 1989

[Percent distribution]

Characteristics	Total	All sci.	Physical sci.	Math. sci.	Computer inf.spec.	Environ. sci.	Life sci.	Psycho-logists	Social sci.	All engineers
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Sex										
Men	82.8	80.0	91.4	89.5	88.4	91.6	77.3	64.0	78.8	96.9
Women	17.2	20.0	8.6	10.5	11.6	8.4	22.7	36.0	21.2	3.1
Race										
White	88.6	90.5	87.8	88.9	86.2	91.9	90.0	95.7	90.8	79.2
Asian/Pacific Islander	9.2	7.1	10.3	9.5	12.2	6.8	8.0	1.6	5.3	19.6
Black	1.6	1.8	1.2	1.1	1.0	1.2	1.4	2.3	3.0	.8
Native American	.2	.2	.2	**	.1	.1	.2	.2	.2	.1
Other	.1	.1	**	**	.1	**	.1	.1	.1	**
No response	.3	.4	.5	.4	.4	.1	.3	.2	.5	.3
Ethnicity										
Hispanic	1.8	1.8	1.6	1.8	1.8	1.6	1.6	2.1	2.1	1.7
Non-Hispanic	96.5	96.5	96.3	96.1	97.2	97.5	96.8	96.6	95.8	96.7
No response	1.7	1.7	2.1	2.0	1.0	.9	1.5	1.3	2.1	1.6
Age										
Under 30	1.1	1.0	2.0	1.2	1.5	.2	.9	.7	.3	1.6
30-34	9.9	9.9	12.8	11.5	8.9	8.2	11.0	8.5	6.7	10.3
35-39	16.7	17.1	13.9	13.3	17.1	15.9	19.1	21.0	14.9	14.9
40-44	19.4	19.8	15.7	16.6	24.7	21.7	20.0	22.3	20.3	17.3
45-49	19.7	19.8	19.2	22.0	24.1	19.1	18.5	17.8	22.8	19.2
50-54	12.7	12.1	14.3	16.2	11.8	12.8	11.5	9.4	11.9	16.1
55-59	9.2	9.1	10.3	9.7	6.1	12.0	8.2	8.4	9.8	9.5
60-64	6.3	6.4	6.8	5.1	3.6	4.8	6.8	6.5	6.6	6.2
65 or over	4.5	4.5	4.8	3.8	1.9	5.0	3.6	4.8	6.3	4.3
No response	.4	.4	.3	.5	.3	.3	.3	.6	.5	.6
Citizenship										
U.S. native-born	83.0	85.7	80.5	77.9	79.5	83.8	86.3	94.5	86.6	69.7
U.S. naturalized	10.7	8.8	11.8	12.5	11.6	9.3	9.0	3.9	8.0	19.9
Non-U.S. perm. resident	5.0	4.4	5.9	7.1	7.7	5.8	3.7	1.4	4.5	8.2
Non-U.S. temp. resident	1.2	1.0	1.8	2.5	1.2	.9	1.0	.2	.8	1.9
No response	.1	**	**	**	**	.2	**	.1	**	.4
Geographic division										
New England	8.1	8.2	8.2	7.3	11.6	8.1	7.7	8.7	8.2	7.2
Middle Atlantic	17.9	17.9	20.9	17.9	20.2	9.4	15.7	20.6	17.8	18.0
East North Central	14.7	14.8	17.3	16.0	12.0	8.7	14.6	14.9	15.1	13.7
West North Central	6.1	6.5	5.3	7.5	3.4	4.0	8.1	6.1	6.8	4.1
South Atlantic	18.3	18.7	18.3	19.4	16.9	18.4	19.1	15.7	21.3	16.5
East South Central	3.8	3.9	3.3	6.0	2.3	3.0	4.3	4.3	3.7	3.3
West South Central	7.7	7.5	6.1	6.9	7.1	13.4	8.6	6.4	6.7	8.4
Mountain	6.2	5.8	5.6	5.7	4.4	14.1	5.1	5.7	5.5	8.1
Pacific	17.0	16.3	14.7	13.2	22.0	20.8	16.5	17.4	14.7	20.5
Other U.S.	.3	.3	.3	.1	**	.2	.3	.3	.2	.3
Place of birth										
U.S.	80.6	83.2	78.2	76.3	76.5	81.7	83.6	91.2	84.4	67.8
Canada	1.1	1.1	1.0	1.1	1.0	1.5	1.4	.7	1.2	.9
Latin & South America	1.0	1.1	.9	1.5	.7	1.8	1.0	1.0	1.3	.9
North,Central,West Europe	3.4	3.5	5.2	5.1	3.0	4.0	2.9	2.5	3.2	3.1
Eastern Europe	1.3	1.2	1.9	2.[illegible]	1.8	1.3	.9	.5	1.0	1.9
Eastern Asia	5.4	3.9	6.1	4.[illegible]	8.9	3.5	4.[illegible]	.5	2.7	12.7
Western Asia	4.0	3.0	3.8	6.0	4.9	3.5	3.1	.7	2.9	8.7
Australasia 1/	.4	.4	.4	.7	.3	.5	.5	.3	.4	.3
Africa	.8	.6	.7	1.1	1.0	.5	.5	.1	1.0	1.8
No response	2.0	2.0	1.9	1.4	2.0	1.8	1.8	2.5	2.0	1.8

** Less than 0.05 percent

1/ Australasia comprises Australia, New Zealand, Indonesia, and the Philippines.

NOTES: All numbers in the table are estimates derived from a sample.

All doctoral scientists and engineers employed in a science or engineering (S&E) field were categorized by their field of employment when that information was available. When it was not or when the employment field was other than science or engineering, doctorate holders were categorized by their field of degree.

SOURCE: National Science Foundation/SRS, 1989 Survey of Doctorate Recipients

Table 21. Employed doctoral scientists and engineers, by demographic characteristics and citizenship status: 1989

[Percent distribution]

Characteristics	Citizenship						
		U.S.			Non-U.S.		
	Total 1/	Total	Native	Natlzd	Total	Perm res	Temp res
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Sex							
Men	82.8	82.6	82.0	87.4	85.9	85.8	86.0
Women	17.2	17.4	18.0	12.6	14.1	14.2	14.0
Race							
White	88.6	91.4	96.8	48.8	47.7	51.0	35.3
Asian/Pacific Islander	9.2	6.6	1.1	49.4	47.3	44.3	58.8
Black	1.6	1.4	1.5	1.2	4.0	3.6	5.1
Native American	.2	.2	.2	.1	**	**	**
Other	.1	.1	.1	.1	.1	.1	**
No response	.3	.3	.3	.4	.8	.8	.8
Ethnicity							
Hispanic	1.8	1.5	1.2	4.2	5.8	5.6	6.8
Non-Hispanic	96.5	96.8	97.3	93.0	92.2	92.6	90.3
No response	1.7	.6	1.5	2.8	2.0	1.8	3.0
Age							
Under 30	1.1	1.0	1.0	.6	2.8	1.6	7.7
30-34	9.9	9.0	9.5	4.5	24.4	17.8	51.2
35-39	16.7	16.0	16.6	11.1	28.4	29.5	24.9
40-44	19.4	19.7	19.7	19.3	15.1	17.2	6.7
45-49	19.7	20.2	20.5	18.2	12.3	14.3	4.3
50-54	12.7	13.1	12.6	17.3	7.0	7.9	3.4
55-59	9.2	9.4	9.1	12.1	4.7	5.7	.7
60-64	6.3	6.6	6.2	9.7	2.9	3.3	.1
65 or over	4.5	4.7	4.5	6.7	1.3	1.5	.2
No response	.4	.4	.4	.5	1.0	1.1	.8
Geographic division							
New England	8.1	8.0	8.0	8.0	8.7	9.0	7.5
Middle Atlantic	17.9	17.6	17.1	21.1	22.2	21.6	25.5
East North Central	14.7	14.6	14.5	14.9	16.1	16.9	13.4
West North Central	6.1	6.2	6.4	4.2	5.4	5.5	5.2
South Atlantic	18.3	18.5	18.7	16.9	15.0	15.0	15.8
East South Central	3.8	3.9	4.0	3.2	2.9	2.4	3.8
West South Central	7.7	7.6	7.8	6.4	8.0	7.8	9.2
Mountain	6.2	6.4	6.7	4.1	3.5	3.3	4.1
Pacific	17.0	17.0	16.5	20.8	17.9	18.1	14.9
Other U.S.	.3	.3	.2	.5	.4	.4	.6
Place of birth							
U.S.	80.6	86.0	97.0	.3	.6	.4	1.5
Canada	1.1	.6	.1	4.4	8.7	10.2	2.2
Latin & South America	1.0	.7	.1	4.8	6.5	6.3	7.4
North,Central,West Europe	3.4	2.4	.3	18.7	18.6	20.4	11.5
Eastern Europe	1.3	1.1	**	9.7	3.9	3.3	6.6
Eastern Asia	5.4	4.1	.2	34.5	24.2	20.5	38.7
Western Asia	4.0	2.4	.1	20.5	27.3	28.8	20.4
Australasia 2/	.4	.2	**	1.7	3.0	3.0	3.1
Africa	.8	.5	**	4.1	5.6	5.0	8.4
No response	2.0	2.0	2.1	1.3	1.7	2.1	.2

** Less than 0.05 percent

1/ Total(s) include(s) individuals for whom citizenship was unspecified and from whom no response was received.
2/ Australasia comprises Australia, New Zealand, Indonesia, and the Philippines.

NOTE: All numbers in the table are estimates derived from a sample.

SOURCE: National Science Foundation/SRS, 1989 Survey of Doctorate Recipients

Table 22. Employed doctoral scientists and engineers, by demographic characteristics and employment sector: 1989

[Percent distribution]

Characteristics	Total 1/ employed	Education		Business/Industry			Government		Non-profit 2/
		Total	Univ./ 4-yr coll	Total	Not self-emp	Self-emp	Federal civilian	State/ Local	
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Sex									
Men	82.8	81.4	82.0	86.6	90.5	72.9	87.0	79.5	71.3
Women	17.2	18.6	18.0	13.4	9.5	27.1	13.0	20.5	28.7
Race									
White	88.6	89.7	89.6	85.8	83.3	94.5	90.3	89.7	92.1
Asian/Pacific Islander	9.2	7.8	8.0	12.6	15.2	3.6	7.5	7.3	6.0
Black	1.6	1.9	1.8	1.2	1.1	1.4	1.4	2.7	1.4
Native American	.2	.2	.2	.1	.1	.2	.3	.2	.2
Other	.1	.1	.1	.1	**	.1	.1	**	**
No response	.3	.4	.4	.3	.3	.2	.4	.1	.2
Ethnicity									
Hispanic	1.8	2.0	2.0	1.5	1.4	1.8	2.0	1.7	1.6
Non-Hispanic	96.5	96.3	96.3	96.8	96.9	96.4	96.6	96.4	97.3
No response	1.7	1.7	1.7	1.7	1.7	1.8	1.3	1.9	1.1
Age									
Under 30	1.1	1.1	1.2	1.1	1.3	.4	.9	.5	1.0
30-34	9.9	10.2	10.6	9.9	11.8	3.3	6.6	6.9	12.1
35-39	16.7	15.8	15.9	17.9	19.0	14.0	12.9	16.1	23.1
40-44	19.4	17.8	17.7	21.4	22.0	19.5	18.8	24.9	20.4
45-49	19.7	19.0	18.8	20.2	19.9	21.1	25.0	17.7	18.8
50-54	12.7	13.0	12.9	12.2	12.4	11.2	16.3	12.6	9.6
55-59	9.2	10.5	10.5	7.6	6.8	10.2	9.7	10.4	5.7
60-64	6.3	7.5	7.6	4.8	4.1	7.3	5.6	7.1	5.7
65 or over	4.5	4.7	4.7	4.5	2.1	12.6	3.7	2.9	3.3
No response	.4	.3	.3	.5	.6	.3	.4	1.0	.4
Citizenship									
U.S. native-born	83.0	83.2	82.8	80.4	77.5	90.4	88.2	87.5	87.9
U.S. naturalized	10.7	9.5	9.6	13.4	15.0	7.6	10.7	9.2	8.0
Non-U.S. perm. resident	5.0	5.7	5.9	5.3	6.4	1.8	.9	2.7	3.1
Non-U.S. temp. resident	1.2	1.5	1.6	.8	1.0	.1	.2	.6	.6
No response	.1	.1	.1	.1	.1	**	**	.1	.4
Geographic division									
New England	8.1	9.1	9.2	7.1	7.0	7.5	3.2	4.7	11.3
Middle Atlantic	17.9	16.0	15.6	23.0	24.0	19.5	3.7	24.7	20.3
East North Central	14.7	16.8	17.0	13.8	14.9	10.0	4.8	11.2	13.7
West North Central	6.1	7.7	7.8	4.3	4.3	4.4	3.2	6.8	5.3
South Atlantic	18.3	15.2	15.1	14.1	13.5	16.3	62.1	16.2	15.7
East South Central	3.8	4.9	5.1	2.7	2.5	3.3	2.6	2.0	2.9
West South Central	7.7	8.5	8.5	7.9	8.2	6.8	3.5	6.5	4.7
Mountain	6.2	6.5	6.5	5.3	4.7	7.2	7.4	8.6	6.9
Pacific	17.0	14.9	14.8	21.7	20.8	24.8	9.4	19.1	19.1
Other U.S.	.3	.4	.4	.2	.1	.2	.1	.2	.1
Place of birth									
U.S.	80.6	80.6	80.2	78.1	75.7	86.4	86.2	85.5	85.6
Canada	1.1	1.3	1.3	.9	1.0	.9	.4	.6	1.0
Latin & South America	1.0	1.1	1.1	.9	.9	1.0	1.0	.4	1.2
North,Central,West Europe	3.4	3.9	4.0	3.0	3.1	2.7	2.6	2.1	2.5
Eastern Europe	1.3	1.4	1.5	1.1	1.0	1.2	1.3	1.2	1.9
Eastern Asia	5.4	4.2	4.3	7.9	9.4	2.6	4.9	4.1	3.2
Western Asia	4.0	4.0	4.1	4.8	5.7	1.8	1.8	3.0	2.5
Australasia 3/	.4	.5	.5	.4	.4	.3	.1	.4	.3
Africa	.8	1.0	1.0	.9	1.0	.3	.2	.6	.2
No response	2.0	2.0	2.0	2.0	1.8	2.9	1.5	2.0	1.5

** Less than 0.05 percent

1/ Total include individuals who work in employment sectors other than education, business/industry, government, and nonprofit organizations; they also include individuals from whom no response was received.
2/ "Nonprofit" [organizations] include hospitals and clinics.
3/ Australasia comprises Australia, New Zealand, Indonesia, and the Philippines.

NOTE: All numbers in the table are estimates derived from a sample.

SOURCE: National Science Foundation/SRS, Survey of Doctorate Recipients

Table 23. Employed doctoral scientists and engineers, by demographic characteristics and primary work activity: 1989

[Percent distribution]

Characteristics	Total employed	Research & Development				Management/Admin			Teaching	Prof. serv.	Consulting	Other/ No resp
		Total	Basic	App'd	Devlop/ Design	Total of R&D	of Other					
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Sex												
Men	82.8	85.3	80.7	87.0	93.8	86.4	92.1	81.1	82.0	64.1	87.3	83.4
Women	17.2	14.7	19.2	13.0	6.2	13.6	7.9	18.9	18.0	35.9	12.7	16.6
Race												
White	88.6	85.6	88.0	85.7	77.7	90.9	88.7	93.0	89.8	94.9	89.2	87.9
Asian/Pacific Islander	9.2	12.9	10.5	12.8	21.2	6.6	9.8	3.7	7.2	3.0	8.5	9.8
Black	1.6	.8	.7	1.0	.4	2.0	1.1	2.9	2.4	1.7	2.0	1.7
Native American	.2	.2	.2	.2	.1	.2	.2	.2	.2	.2	.2	.1
Other	.1	**	.1	**	**	.1	.1	.1	.1	.1	**	.1
No response	.3	.4	.6	.3	.5	.2	.2	.1	.4	.2	.1	.4
Ethnicity												
Hispanic	1.8	1.8	2.3	1.5	.9	1.6	1.5	1.7	1.8	2.1	2.7	1.7
Non-Hispanic	96.5	96.4	95.5	97.1	97.2	96.8	97.2	96.4	96.6	96.8	95.7	96.4
No response	1.7	1.8	2.2	1.4	1.9	1.6	1.3	1.9	1.6	1.1	1.6	1.9
Age												
Under 30	1.1	2.2	3.2	1.6	1.3	.1	.1	**	.5	.6	1.0	.4
30-34	9.9	17.1	20.4	16.1	10.2	2.6	2.9	2.3	6.0	8.8	6.9	7.3
35-39	16.7	21.4	23.0	21.0	18.0	11.0	13.8	8.3	12.8	23.8	11.3	14.8
40-44	19.4	19.9	17.8	20.9	22.8	20.7	23.0	18.6	16.7	22.3	18.7	20.1
45-49	19.7	15.2	13.2	15.4	20.9	26.6	24.3	28.7	20.6	17.7	19.8	24.5
50-54	12.7	9.9	8.6	10.6	11.7	16.9	16.8	16.9	15.2	9.0	11.6	13.9
55-59	9.2	6.1	5.8	6.2	7.0	11.4	9.9	12.7	12.7	7.3	10.8	8.7
60-64	6.3	4.4	4.2	4.5	4.8	7.6	6.6	8.6	9.2	5.2	7.0	4.7
65 or over	4.5	3.1	3.1	3.1	2.9	3.0	2.2	3.8	6.1	4.4	12.6	5.4
No response	.4	.6	.6	.6	.3	.3	.4	.2	.2	.8	.4	.3
Citizenship												
U.S. native-born	83.0	79.0	79.5	80.0	73.5	87.1	82.8	91.1	83.3	92.2	81.5	83.8
U.S. naturalized	10.7	12.0	9.6	12.4	18.6	10.2	13.4	7.1	10.3	6.2	11.8	10.6
Non-U.S. perm. resident	5.0	6.8	7.8	5.9	6.9	2.7	3.7	1.7	5.4	1.6	5.5	4.0
Non-U.S. temp. resident	1.2	2.1	2.9	1.7	.9	**	**	**	1.0	**	1.2	1.2
No response	.1	.1	.2	**	.1	**	.1	**	**	**	**	.3
Geographic division												
New England	8.1	8.4	9.7	7.3	8.5	6.4	5.5	7.2	8.9	8.3	[illegible]	7.2
Middle Atlantic	17.9	18.4	17.7	18.0	22.1	16.8	18.2	15.5	16.8	20.8	[illegible]	18.7
East North Central	14.7	15.1	15.5	14.9	14.2	14.0	13.6	14.5	17.1	13.2	[illegible]	11.6
West North Central	6.1	4.9	5.2	5.4	2.6	5.5	4.3	6.6	8.8	6.7	.5	4.4
South Atlantic	18.3	17.3	16.8	18.6	13.7	23.1	23.5	22.8	15.7	14.6	[illegible]	22.0
East South Central	3.8	3.3	4.1	3.2	1.3	4.1	3.5	4.7	4.9	3.9	1.7	3.2
West South Central	7.7	7.2	6.9	7.4	7.9	7.3	6.5	8.0	8.8	7.5	7.6	7.3
Mountain	6.2	6.4	5.6	7.2	5.7	6.1	5.9	6.3	5.8	5.9	6.1	6.9
Pacific	17.0	18.7	18.4	17.7	23.8	16.3	18.7	14.1	12.8	19.0	23.5	18.6
Other U.S.	.3	.2	.2	.2	.1	.4	.3	.4	.4	.2	.8	**
Place of birth												
U.S.	80.6	76.5	76.6	77.9	71.3	85.1	81.4	88.6	80.9	88.7	79.1	81.6
Canada	1.1	1.3	1.5	1.3	.5	.9	.8	1.0	1.2	.8	1.2	.6
Latin & South America	1.0	1.0	1.3	.9	.7	.7	.8	.7	1.1	1.2	1.7	1.0
North,Central,West Europe	3.4	3.6	4.9	3.0	1.9	3.6	4.2	3.1	3.7	2.6	3.6	2.2
Eastern Europe	1.3	1.5	1.8	1.4	.9	.8	1.1	.5	1.6	.6	1.9	1.1
Eastern Asia	5.4	8.2	6.2	8.1	14.8	3.7	6.2	1.4	3.5	1.5	5.4	5.4
Western Asia	4.0	4.6	3.9	4.5	7.3	2.6	3.0	2.3	4.5	1.4	4.3	4.4
Australasia 1/	.4	.4	.5	.4	.1	.5	.4	.6	.4	.3	.2	.4
Africa	.8	.7	.7	.7	.9	.4	.6	.2	1.3	.3	.7	1.4
No response	2.0	2.2	2.6	1.9	1.5	1.6	1.4	1.8	1.8	2.5	1.9	1.7

** Less than 0.05 percent

1/ Australasia comprises Australia, New Zealand, Indonesia, and the Philippines.

NOTE: All numbers in the table are estimates derived from a sample.

SOURCE: National Science Foundation/SRS, 1989 Survey of Doctorate Recipients

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Table 24. Employed doctoral scientists and engineers, by demographic characteristics, race/ethnicity, and sex: 1989

[Percent distribution]

Characteristics	Total 1/			White			Asian/Pacific Islander		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Age									
Under 30	1.1	1.0	1.6	1.1	1.0	1.6	1.4	1.3	1.9
30-34	9.9	9.1	14.0	9.5	8.6	13.8	14.0	13.3	18.1
35-39	16.7	15.3	23.6	16.4	14.9	23.5	20.1	19.4	24.6
40-44	19.4	18.8	22.4	19.1	18.4	22.4	20.8	20.7	21.5
45-49	19.7	20.5	16.1	20.1	20.9	16.2	16.0	16.3	14.0
50-54	12.7	13.5	9.0	12.8	13.6	9.0	12.9	13.2	11.0
55-59	9.2	9.8	5.9	9.3	10.0	5.9	7.8	8.2	5.1
60-64	6.3	6.8	4.2	6.6	7.0	4.4	4.3	4.6	2.4
65 or over	4.5	4.9	2.6	4.8	5.2	2.8	2.1	2.3	.8
No response	.4	.4	.6	.4	.3	.5	.6	.7	.6
Citizenship									
U.S. native-born	83.0	82.2	87.0	90.7	90.4	92.3	10.3	9.1	18.4
U.S. naturalized	10.7	11.3	7.8	5.9	6.2	4.6	57.4	58.4	50.8
Non-U.S. perm. resident	5.0	5.2	4.2	2.9	3.0	2.6	24.2	24.3	24.0
Non-U.S. temp. resident	1.2	1.2	1.0	.5	.5	.5	7.6	7.7	6.6
No response	.1	.1	.1	**	**	**	.5	.6	.2
Geographic division									
New England	8.1	7.8	9.2	8.2	8.0	9.5	6.6	6.4	7.7
Middle Atlantic	17.9	17.3	20.9	17.7	17.0	21.0	20.6	20.4	21.5
East North Central	14.7	14.8	13.9	14.6	14.7	13.9	15.7	16.0	13.6
West North Central	6.1	6.3	5.4	6.3	6.5	5.7	4.5	4.5	4.5
South Atlantic	18.3	18.4	17.7	18.5	18.8	17.4	14.5	14.4	15.1
East South Central	3.8	4.0	3.1	3.9	4.0	3.1	2.9	3.0	2.2
West South Central	7.7	7.8	6.8	7.6	7.7	7.0	8.2	8.6	5.6
Mountain	6.2	6.4	5.1	6.6	6.8	5.3	3.3	3.4	2.7
Pacific	17.0	16.9	17.6	16.4	16.2	17.0	23.6	23.1	26.8
Other U.S.	.3	.3	.3	.3	.3	.2	**	**	.2
Place of birth									
U.S.	80.6	79.8	84.4	88.2	87.9	89.6	9.1	7.9	16.9
Canada	1.1	1.1	1.0	1.2	1.2	1.2	.3	.3	.1
Latin & South America	1.0	1.0	1.3	.9	.9	1.1	.4	.4	.3
North,Central,West Europe	3.4	3.5	3.0	3.8	3.9	3.3	.2	.1	.9
Eastern Europe	1.3	1.3	1.1	1.5	1.5	1.3	**	**	**
Eastern Asia	5.6	5.6	4.1	.2	.2	.1	56.7	56.6	57.4
Western Asia	4.0	4.4	1.9	1.4	1.5	.9	29.3	31.2	16.3
Australasia 2/	.4	.3	.7	.2	.2	.3	2.4	1.7	6.7
Africa	.8	.9	.4	.6	.7	.3	.2	.2	.4
No response	2.0	2.0	1.9	2.0	2.0	2.0	1.5	1.5	1.0

(Cont.) Characteristics	Black			Native American			Hispanic 3/		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Age									
Under 30	.4	.2	.8	1.9	2.5	**	1.3	1.2	1.9
30-34	9.1	7.5	12.7	12.8	11.7	16.4	15.3	13.6	21.9
35-39	15.7	13.1	21.5	12.6	9.5	22.4	24.0	23.4	26.4
40-44	25.5	25.6	25.2	19.6	19.4	20.2	19.9	18.8	24.0
45-49	19.5	20.6	17.1	30.6	31.9	26.2	17.6	18.6	13.9
50-54	11.1	12.7	7.5	4.0	3.9	4.4	8.9	10.0	4.6
55-59	9.7	10.3	8.3	8.2	9.3	4.4	7.4	8.6	3.0
60-64	5.4	6.4	3.1	9.2	10.9	3.8	2.7	2.9	2.0
65 or over	2.7	3.1	1.8	.6	.8	**	2.0	2.0	1.9
No response	1.0	.6	2.1	.5	**	2.2	.8	.9	.4
Citizenship									
U.S. native-born	76.0	70.4	88.2	96.8	96.6	97.3	54.8	53.8	58.5
U.S. naturalized	8.2	9.0	6.4	3.2	3.4	2.7	25.0	25.2	24.3
Non-U.S. perm. resident	12.0	15.4	4.4	**	**	**	15.7	16.6	12.1
Non-U.S. temp. resident	3.8	5.1	.9	**	**	**	4.4	4.3	4.8
No response	.1	.1	.1	**	**	**	.1	**	.3
Geographic division									
New England	4.6	4.3	5.4	6.0	6.1	5.5	7.7	7.7	7.7
Middle Atlantic	14.4	13.1	17.3	12.7	13.1	11.5	12.5	11.6	15.0
East North Central	14.4	14.6	14.0	7.8	7.6	8.2	10.6	10.8	9.8
West North Central	3.7	4.5	1.9	4.9	4.4	6.6	4.6	4.8	3.7
South Atlantic	30.0	28.1	34.2	12.4	12.1	13.7	17.7	17.2	19.7
East South Central	6.3	6.8	5.2	3.9	4.8	1.1	3.5	4.0	1.9
West South Central	8.1	8.8	6.4	22.9	29.0	3.3	8.8	9.3	7.1
Mountain	3.3	3.3	3.3	8.5	4.6	21.3	6.6	6.4	7.6
Pacific	14.7	16.1	11.5	20.9	18.3	29.0	19.3	19.1	20.3
Other U.S.	.6	.4	.8	**	**	**	8.5	9.2	6.2
Place of birth									
U.S.	73.8	68.3	86.0	95.5	96.3	92.9	52.8	52.1	55.7
Canada	**	**	**	**	**	**	.1	**	.4
Latin & South America	8.1	8.9	6.4	3.0	3.1	2.7	37.3	37.3	37.2
North,Central,West Europe	.4	.3	.8	**	**	**	4.7	4.9	3.9
Eastern Europe	**	**	**	**	**	**	.4	.4	.2
Eastern Asia	.1	**	.2	.5	.7	**	.4	.4	.5
Western Asia	**	**	**	**	**	**	.2	.2	.2
Australasia 2/	**	**	**	**	**	**	1.5	1.7	.9
Africa	15.2	20.1	4.2	**	**	**	.6	.5	.7
No response	2.4	2.3	2.5	1.0	**	4.4	2.1	2.5	.4

** Less than 0.05 percent

1/ Totals include individuals whose race was specified as "other" and individuals from whom no response was received.
2/ Australasia comprises Australia, New Zealand, Indonesia, and the Philippines.
3/ Individuals who are included in the ethnic category "Hispanic" also may have been included in one of the race categories.

NOTE: All numbers in the table are estimates derived from a sample.

SOURCE: National Science Foundation/SRS, 1989 Survey of Doctorate Recipients

Table 25. Employed doctoral scientists and engineers, by employment-related characteristics and citizenship status: 1989

[Percent distribution]

Characteristics	Citizenship						
		U.S.			Non-U.S.		
	Total 1/	Total	Native	Natlzd	Total	Perm res	Temp res
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Type of employment							
Science/Engineering	90.4	90.3	90.2	91.2	92.9	92.8	94.7
Other/Unknown field	9.6	9.7	9.8	8.8	7.1	7.2	5.3
Sector of employment							
Business/Industry, total	32.4	32.4	31.3	40.6	32.0	34.4	22.7
Not self-employed	25.1	24.8	23.4	35.4	29.8	31.8	22.2
Self-employed	7.2	7.6	7.9	5.2	2.2	2.6	.5
Educational institution	51.5	50.9	51.6	45.7	59.8	58.7	65.7
Univ./4-yr college	49.2	48.6	49.1	44.4	58.9	57.6	65.7
Other	2.2	2.3	2.4	1.3	.9	1.1	.1
Federal govt. (civilian)	6.5	6.9	6.9	6.5	1.1	1.2	1.0
State/Local govt	2.3	2.4	2.4	2.0	1.2	1.3	1.1
Hospitals/Clinics	2.8	3.0	3.1	1.9	.8	.9	.3
Other non-profits	3.6	3.6	3.7	2.9	3.4	3.0	3.0
Other/No response	.9	.9	.9	.4	1.6	.6	6.1
Primary work activity							
Research and development	37.1	36.1	35.3	41.9	52.9	50.1	65.5
Basic research	15.1	14.4	14.5	13.6	26.0	23.3	37.0
Applied research	17.4	17.1	16.7	20.2	21.1	20.3	25.0
Development	4.7	4.6	4.2	8.2	5.9	6.4	3.6
Management/Administration	16.4	17.0	17.2	15.6	7.0	8.7	.2
of R&D	7.9	8.1	7.9	9.9	4.6	5.7	**
of Other	8.5	8.9	9.3	5.7	2.4	2.9	.1
Teaching	25.1	25.1	25.2	24.2	25.6	27.1	20.4
Professional services	8.2	8.6	9.1	4.7	2.1	2.6	.2
Rprt/Stat/Comput activ	2.9	2.9	2.9	2.7	3.3	2.9	2.8
Consulting	3.7	3.7	3.7	4.1	4.0	4.1	3.9
Other/No response	6.6	6.7	6.7	6.7	5.1	4.7	7.0
Federal support							
Receiving support	44.2	44.4	44.3	45.1	42.5	41.0	48.0
Not receiving support	53.0	53.0	53.1	51.6	53.8	56.2	45.5
Status unknown/No response	2.7	2.7	2.6	3.3	3.7	2.7	6.4
Area of national interest							
Education	21.4	21.4	21.6	19.9	21.6	23.1	15.9
Health	20.8	21.4	22.0	16.5	13.0	14.2	9.0
National defense	6.3	6.6	6.4	8.2	1.6	1.8	1.1
Environment	6.4	6.5	6.7	4.8	5.1	5.6	3.0
Space	1.5	1.5	1.4	2.4	1.6	1.6	1.4
Communications	2.9	2.8	2.8	2.8	5.3	5.7	3.7
Food or agriculture	5.5	5.6	5.8	3.9	4.1	4.1	4.2
Energy of fuel	5.0	4.9	4.6	7.4	7.2	7.3	6.6
Mineral resources	.5	.5	.5	.6	.5	.5	.7
Biotechnology	3.2	3.0	3.0	3.5	4.9	4.2	8.0
Community dev./services	1.4	1.4	1.4	1.2	.8	1.0	**
Housing	.4	.4	.4	.4	.7	.3	.2
Transportation	1.3	1.3	1.1	2.5	1.5	1.5	1.7
Other	14.8	14.5	14.5	14.6	20.1	19.6	21.5
No response	8.5	8.2	7.8	11.5	12.1	9.7	23.0

** Less than 0.05 percent

1/ Total(s) include(s) individuals for whom citizenship was unspecified and from whom no response was received.

NOTE: All numbers in the table are estimates derived from a sample.

SOURCE: National Science Foundation/SkS, 1989 Survey of Doctorate Recipients

Table 26. Employed doctoral scientists and engineers, by employment-related characteristics, race/ethnicity, and sex: 1989

[Percent distribution]

Characteristics	Total 1/			White			Asian/Pacific Islander		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Type of employment									
Science/Engineering	90.4	90.8	88.7	90.3	90.6	88.9	93.3	93.8	90.3
Other/Unknown field	9.6	9.2	11.3	9.7	9.4	11.1	6.7	6.2	9.7
Sector of employment									
Business/Industry, total	32.4	33.8	25.3	31.3	32.6	25.2	44.3	46.6	28.4
Not self-employed	25.1	27.5	13.9	23.6	25.8	13.1	41.4	43.8	25.4
Self-employed	7.2	6.4	11.4	7.7	6.8	12.1	2.9	2.8	3.0
Educational institution	51.5	50.6	55.5	52.1	51.4	55.4	43.7	42.0	55.1
Univ./4-yr college	49.2	48.7	51.7	49.8	49.4	51.6	42.8	41.5	51.8
Other	2.2	1.9	3.9	2.3	2.0	3.8	.8	.5	3.3
Federal govt. (civilian)	6.5	6.8	4.9	6.6	7.0	4.9	5.3	5.3	5.3
State/Local govt	2.3	2.2	2.8	2.3	2.3	2.6	1.8	1.6	3.2
Hospitals/Clinics	2.8	2.3	5.6	3.0	2.4	5.9	1.3	1.0	3.1
Other non-profits	3.6	3.3	5.2	3.7	3.4	5.3	2.9	2.7	4.3
Other/No response	.9	.9	.8	.9	1.0	.8	.7	.7	.6
Primary work activity									
Research and development	37.1	38.3	31.8	35.9	36.9	30.7	52.2	52.0	53.6
Basic research	15.1	14.7	16.9	15.0	14.7	16.4	17.3	15.5	29.1
Applied research	17.4	18.2	13.2	16.8	17.6	12.8	24.1	24.7	20.1
Development	4.7	5.3	1.7	4.1	4.7	1.5	10.8	11.8	4.4
Management/Administration	16.4	17.1	13.0	16.8	17.6	13.0	11.8	12.3	9.1
of R&D	7.9	8.8	3.6	7.9	8.8	3.6	8.4	9.1	3.9
of Other	8.5	8.3	9.3	8.9	8.8	9.4	3.4	3.2	5.2
Teaching	25.1	24.9	26.3	25.5	25.2	26.4	19.7	19.7	20.1
Professional Services	8.2	6.3	17.0	8.7	6.8	18.0	2.7	2.4	4.4
Rprt/Stat/Comput activ	2.9	2.9	3.0	2.8	2.8	2.9	3.2	3.0	4.9
Consulting	3.7	3.9	2.8	3.8	4.0	2.8	3.5	3.7	1.7
Other/No response	6.6	6.7	6.2	6.5	6.6	6.2	6.9	7.0	6.2
Federal support									
Receiving support	44.2	45.3	39.4	44.2	45.3	38.8	45.4	45.0	48.6
Not receiving support	53.0	52.2	57.0	53.2	52.2	57.7	51.6	52.1	48.3
Status unknown/No response	2.7	2.6	3.6	2.7	2.5	3.5	2.9	2.9	3.0

(Cont.) Characteristics	Black			Native American			Hispanic 2/		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Type of employment									
Science/Engineering	82.0	82.3	81.4	95.2	96.3	91.8	90.9	91.6	88.5
Other/Unknown field	18.0	17.7	18.6	4.8	3.7	8.2	9.1	8.4	11.5
Sector of employment									
Business/Industry, total	23.3	26.0	17.3	24.6	23.8	27.3	26.9	28.4	21.3
Not self-employed	16.8	20.5	8.6	18.3	18.2	18.6	19.6	21.5	12.1
Self-employed	6.4	5.4	8.6	6.3	5.6	8.7	7.3	6.8	9.2
Educational Institution	59.8	58.4	62.9	54.5	56.0	49.7	56.5	55.9	58.9
Univ./4-yr college	55.5	55.8	54.9	52.6	53.8	48.6	53.6	53.2	55.2
Other	4.3	2.6	8.0	1.9	2.2	1.1	2.9	2.7	3.6
Federal govt. (civilian)	5.7	6.3	4.4	9.8	9.5	10.9	7.3	8.0	4.4
State/Local govt	3.9	2.9	6.2	3.1	3.7	1.1	2.2	1.9	3.4
Hospitals/Clinics	3.3	2.4	5.2	4.5	4.4	4.9	3.4	3.0	5.2
Other non-profits	2.4	2.1	3.2	2.1	1.9	2.7	2.3	1.9	3.8
Other/No response	1.6	1.9	.9	1.3	.7	3.3	1.4	1.0	3.0
Primary work activity									
Research and development	19.2	21.1	14.8	37.2	41.4	23.5	36.5	37.9	31.2
Basic research	6.8	7.5	5.1	16.3	19.2	7.1	19.4	20.0	17.4
Applied research	11.2	12.0	9.3	18.8	19.9	15.3	14.7	15.2	13.0
Development	1.2	1.5	.4	2.1	2.4	1.1	2.4	2.8	.8
Management/Administration	20.8	21.3	19.7	16.3	12.9	27.3	14.6	15.0	13.3
of R&D	5.2	6.5	2.5	7.1	7.1	7.1	6.6	7.3	3.9
of Other	15.5	14.8	17.2	9.2	5.8	20.2	8.1	7.7	9.4
Teaching	36.9	36.7	37.4	30.2	32.6	22.4	24.9	24.9	24.8
Professional services	8.4	5.0	15.9	9.1	6.5	17.5	9.5	7.3	18.1
Rprt/Stat/Comput activ	3.3	3.8	2.4	**	**	**	2.6	2.2	4.4
Consulting	4.6	5.1	3.4	4.1	4.2	3.8	5.5	6.3	2.5
Other/No response	6.8	6.9	6.4	3.1	2.4	5.5	6.3	6.4	5.8
Federal support									
Receiving support	41.9	43.3	38.9	40.3	38.4	46.4	44.7	46.7	37.0
Not receiving support	53.6	53.0	55.0	56.2	60.4	42.6	51.3	49.7	57.6
Status unknown/No response	4.5	3.7	6.1	3.5	1.2	10.9	4.1	3.7	5.5

**Less than 0.05 percent

1/ Totals include individuals whose race was specified as "other" and individuals from whom no response was received.

2/ Individuals who are included in the ethnic category "Hispanic" also may have been included in one of the race categories.

NOTE: All numbers in the table are estimates derived from a sample.

SOURCE: National Science Foundation/SRS, 1989 Survey of Doctorate Recipients

Table 27. Employed doctoral scientists and engineers, by employment-related characteristics and employment sector: 1989

[Percent distribution]

Characteristics	Total 1/ employed	Education		Business/Industry			Government		Non-profit 2/
		Total	Univ./ 4-yr coll	Total	Not self-emp	Self-emp	Federal civilian	State/ Local	
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Field 3/									
SCIENTISTS	83.3	89.1	88.7	71.1	65.9	89.2	84.5	94.8	92.4
Physical scientists	15.6	13.1	13.1	22.1	27.0	5.1	15.7	4.1	8.9
Chemists	10.2	7.0	6.8	17.8	21.8	4.0	7.4	3.3	3.7
Physicists/Astronomers	5.5	6.1	6.3	4.3	5.2	1.1	8.3	.7	5.2
Mathematical scientists	3.9	6.2	6.2	1.5	1.5	1.3	2.7	.6	1.0
Mathematicians	3.3	5.3	5.3	1.2	1.1	1.2	1.7	.4	.9
Statisticians	.6	.9	.9	.3	.3	.1	1.0	.2	.1
Computer/Information spec	4.4	2.8	2.9	7.9	9.2	3.4	2.8	3.0	2.1
Environmental scientists	4.4	3.5	3.5	4.3	4.8	2.6	11.2	10.9	3.1
Earth scientists	3.4	2.5	2.5	3.9	4.4	2.2	7.6	9.7	1.5
Oceanographers	.5	.6	.6	.2	.2	.2	1.5	.8	.9
Atmospheric scientists	.5	.4	.4	.2	.2	.2	2.0	.4	.6
Life scientists	25.8	30.5	31.1	16.2	16.3	16.0	31.2	26.4	29.7
Biological scientists	15.0	19.3	19.6	7.9	8.8	4.7	18.0	13.9	13.8
Agricultural scientists	3.7	3.9	3.9	2.9	2.9	2.9	8.2	3.5	1.6
Medical scientists	7.2	7.3	7.6	5.4	4.6	8.4	5.0	9.1	14.3
Psychologists	13.5	11.4	10.4	13.7	3.1	50.4	4.9	21.3	35.5
Social scientists	15.6	21.6	21.6	5.4	4.0	10.3	16.0	28.6	12.1
Economists	4.1	5.4	5.6	1.8	1.7	2.1	5.2	4.0	2.3
Sociologists/Anthropol	3.0	4.8	4.7	.9	.6	1.7	.6	1.7	2.3
Other social scientists	8.4	11.3	11.2	2.7	1.7	6.5	10.1	23.0	7.4
ENGINEERS	16.7	10.9	11.3	28.9	34.1	10.8	15.5	5.2	7.6
Aeronautical/Astron	1.4	.5	.6	2.8	3.5	.6	2.4	*	.9
Chemical	1.8	.9	1.0	3.7	4.6	.9	.8	.1	.4
Civil	1.5	1.6	1.6	1.7	1.7	1.7	1.5	2.9	.3
Electrical/Electronic	3.4	2.1	2.2	6.0	7.4	1.5	3.2	.5	1.3
Materials science	1.8	.9	.9	3.8	4.6	1.0	1.6	.3	.8
Mechanical	1.6	1.6	1.6	2.2	2.5	.9	1.2	.1	.8
Nuclear	.5	.3	.3	1.0	1.2	.3	.3	*	.9
Systems design	.9	.5	.5	1.6	1.9	.5	.7	.2	.9
Other	3.7	2.5	2.6	6.1	6.9	3.5	3.7	1.0	1.3
Years of prof. experience									
Less than 5	16.0	16.4	16.4	13.3	14.1	10.6	13.5	21.5	26.6
5-9	18.7	17.0	16.8	21.4	21.6	20.8	15.0	20.1	21.9
10-14	18.0	16.4	16.1	20.2	20.2	20.0	20.3	22.9	16.8
15-19	17.7	17.2	17.1	18.1	18.5	16.9	22.5	15.7	16.2
20-24	13.2	14.7	14.9	11.9	12.6	9.5	15.5	8.9	7.9
25-29	7.0	8.4	8.6	5.8	5.9	5.4	6.7	4.1	4.0
30-34	4.3	5.0	5.2	4.0	3.4	6.3	3.2	2.6	2.5
35 or more	2.9	3.1	3.3	3.1	2.2	6.2	1.9	1.4	2.1
No response	2.0	1.8	1.8	2.3	1.7	4.3	1.3	2.8	1.9
Primary work activity									
Research and development	37.1	34.5	36.0	40.8	50.0	8.7	53.1	21.7	31.5
Basic research	15.1	22.8	23.8	2.9	3.3	1.6	18.2	5.5	16.0
Applied research	17.4	11.3	11.8	25.1	31.1	4.2	31.7	15.4	13.7
Development	4.7	.4	.4	12.7	15.6	2.9	3.2	.8	1.9
Management/Administration	16.4	10.9	10.7	19.9	24.6	3.5	29.6	34.1	21.1
of R&D	7.9	1.7	1.7	15.6	19.7	1.1	20.1	7.1	6.4
of Other	8.4	9.1	8.9	4.3	4.9	2.4	9.3	26.9	14.5
Teaching	25.1	48.0	47.5	.5	.4	1.1	1.3	1.2	1.8
Professional services	8.2	3.2	2.5	12.2	1.2	50.0	1.3	13.7	32.9
Rprt/Stat/Comput activ	2.9	.8	.8	4.7	5.2	3.2	6.0	8.6	4.3
Consulting	3.7	.3	.3	10.0	6.8	21.1	.8	3.3	2.8
Other/No response	6.6	2.2	2.2	11.9	11.8	12.3	7.9	17.4	5.6

** Less than 0.05 percent

1/ Totals include individuals who work in employment sectors other than education, business/industry, government, and nonprofit organizations; they also include individuals from whom no response was received.
2/ "Nonprofit" [organizations] include hospitals and clinics.
3/ All doctoral scientists and engineers employed in a science or engineering (S&E) field were categorized by their field of employment when that information was available. When it was not, or when employment field was other than science or engineering, the doctorate holders were categorized by their field of doctoral degree.

NOTE: All numbers in the table are estimates derived from a sample.

SOURCE: National Science Foundation/SRS, Survey of Doctorate Recipients

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Table 28. Employed doctoral scientists and engineers, by employment-related characteristics and primary work activity: 1989

[Percent distribution]

Characteristics	Total employed	Research & Development				Management/Admin.			Teaching	Prof. serv.	Consulting	Other/ No resp
		Total	Basic	App'd	Devlop/ Design	Total of R&D	of Other					
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Field 1/												
SCIENTISTS	83.3	79.6	94.7	76.0	44.4	78.4	68.8	87.3	88.7	99.6	68.9	83.9
Physical scientists	15.6	21.4	19.3	24.1	18.2	16.4	24.0	9.3	12.9	1.5	7.4	14.6
Chemists	10.2	13.4	9.1	17.1	13.6	11.6	17.6	5.9	7.9	.8	5.6	11.1
Physicists/Astronomers	5.5	8.0	10.1	7.1	4.6	4.8	6.3	3.4	5.0	.7	1.8	3.6
Mathematical scientists	3.9	2.7	4.6	1.5	1.0	1.8	.7	2.9	8.7	.1	2.0	4.0
Mathematicians	3.3	2.3	4.0	1.3	.9	1.7	.6	2.6	7.5	.1	1.5	2.4
Statisticians	.6	.3	.6	.2	.1	.2	.1	.2	1.2	**	.4	1.5
Computer/Information spec	4.4	4.0	2.2	2.8	13.9	5.4	6.7	4.3	3.2	.1	5.3	11.1
Environmental scientists	4.4	5.2	5.8	5.8	1.2	5.1	6.0	4.3	3.1	.2	10.6	4.6
Earth scientists	3.4	3.5	3.6	4.1	.7	3.8	4.1	3.6	2.6	.2	10.1	4.2
Oceanographers	.5	.8	1.3	.6	**	.8	1.1	.5	.2	**	.4	.3
Atmospheric scientists	.5	.9	.9	1.1	.4	.5	.8	.2	.2	**	.1	.1
Life scientists	25.8	34.1	49.7	27.8	7.5	23.7	22.7	24.7	19.5	19.3	15.8	23.1
Biological scientists	15.0	23.2	41.3	12.6	4.0	10.5	10.8	10.3	13.0	2.0	6.6	10.5
Agricultural scientists	3.7	5.0	1.8	8.6	1.6	3.9	4.8	3.0	1.9	.6	4.5	5.4
Medical scientists	7.2	6.0	6.6	6.6	1.9	9.3	7.1	11.4	4.7	16.7	4.7	7.3
Psychologists	13.5	4.2	4.9	4.3	1.5	9.5	2.5	16.0	11.9	76.8	13.4	6.7
Social scientists	15.6	8.0	8.4	9.7	1.1	16.3	6.1	25.8	29.5	1.7	14.4	19.6
Economists	4.1	2.8	2.4	3.9	.5	3.8	1.6	6.0	6.9	.3	5.6	5.1
Sociologists/Anthropol	3.0	1.4	2.1	1.2	.1	2.3	.5	3.9	7.1	.5	2.1	2.4
Other social scientists	8.4	3.8	3.9	4.6	.5	10.2	4.0	15.9	15.5	.9	6.7	12.1
ENGINEERS	16.7	20.4	5.3	24.0	55.6	21.6	31.2	12.7	11.3	.4	31.1	16.1
Aeronautical/Astron	1.4	1.9	.5	1.9	6.6	2.1	4.0	.4	.6	**	2.2	1.3
Chemical	1.8	2.8	.7	3.8	6.0	1.8	2.5	1.1	.7	**	2.2	1.7
Civil	1.5	.9	.4	1.2	1.1	1.3	.7	2.0	2.2	.2	8.7	1.3
Electrical/Electronic	3.4	4.0	1.1	3.5	15.6	5.3	8.8	2.1	2.5	**	2.5	2.8
Materials sciences	1.8	2.7	.7	3.8	5.4	1.9	3.3	.6	.9	**	1.8	2.5
Mechanical	1.6	1.9	.4	2.2	5.7	1.5	2.0	1.1	2.1	.1	1.8	.9
Nuclear	.5	.7	**	1.0	1.9	.8	1.0	.6	.1	**	1.5	.8
Systems design	.9	1.0	.4	.9	3.7	1.4	2.1	.8	.3	**	2.4	.9
Other	3.7	4.3	1.1	5.8	9.6	5.4	7.0	3.9	1.9	**	7.9	4.0
Years of prof. experience												
Less than 5	16.0	22.4	26.9	20.9	13.5	6.3	5.0	7.5	12.1	21.7	12.2	14.9
5-9	18.7	22.2	21.0	22.5	21.5	13.2	13.8	12.7	15.5	27.0	14.6	17.3
10-14	18.0	17.5	15.6	18.2	21.5	19.4	21.3	17.6	16.0	20.2	19.6	20.8
15-19	17.7	14.3	12.5	14.6	18.7	24.3	23.6	24.9	19.1	14.1	18.1	19.4
20-24	13.2	10.8	10.2	10.9	11.8	18.3	18.2	18.4	16.6	7.0	12.6	10.8
25-29	7.0	5.3	5.9	4.7	5.3	9.4	9.2	9.7	9.6	3.5	7.1	5.6
30-34	4.3	3.3	3.3	3.4	3.0	4.8	4.7	5.0	5.9	3.0	6.5	3.6
35 or more	2.9	2.7	3.0	2.4	2.7	2.9	3.1	2.6	3.4	1.3	7.4	2.2
No response	2.0	1.5	1.5	1.3	1.9	1.4	1.1	1.6	1.9	2.2	2.0	5.4
Sector of employment												
Business/Industry, total	32.4	35.5	6.3	46.7	87.9	39.3	63.8	16.5	.7	48.2	86.6	56.9
Not self-employed	25.1	33.8	5.5	45.0	83.5	37.7	62.8	14.4	.4	3.8	45.7	45.1
Self-employed	7.2	1.7	.8	1.8	4.4	1.6	1.0	2.1	.3	44.4	40.9	11.8
Educational institution	51.5	47.9	77.9	33.5	4.4	34.3	10.9	56.1	98.3	20.2	4.2	16.5
Univ./4-yr college	49.2	47.7	77.8	33.3	4.4	32.1	10.7	52.0	93.0	15.0	4.1	15.8
Other	2.2	.1	.1	.2	**	2.2	.2	4.1	5.3	5.2	.2	.7
Federal govt. (civilian)	6.5	9.3	7.9	11.9	4.5	11.8	16.6	7.4	.3	1.0	1.4	9.5
State/Local govt	2.3	1.4	.8	2.1	.4	4.8	2.1	7.4	.1	3.9	2.1	6.4
Hospitals/Clinics	2.8	1.0	1.2	.9	.2	2.6	.3	4.8	.2	22.2	.7	1.6
Other non-profits	3.6	4.5	5.6	4.1	2.3	5.7	4.9	6.4	.3	3.7	4.0	5.1
Other/No response	.9	.5	.2	.7	.3	1.5	1.4	1.5	.1	.8	.9	3.9

** Less than 0.05 percent

1/ All doctoral scientists and engineers employed in a science or engineering (S&E) field were categorized by their field of employment when that information was available. When it was not, or when employment field was other than science or engineering, the doctorate holders were categorized by their field of doctoral degree.

NOTE: All numbers in the table are estimates derived from a sample.

SOURCE: National Science Foundation/SRS, 1989 Survey of Doctorate Recipients

Table 29. Employed doctoral scientists and engineers, by employment-related characteristics and broad field: 1989

[Percent distribution]

Characteristics	Total	All sci.	Physical sci.	Math. sci.	Computer inf.spec.	Environ. sci.	Life sci.	Psycho-logists	Social sci.	All engineers
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Years of prof. experience										
Less than 5	16.0	16.3	14.6	12.3	14.8	13.3	18.4	18.4	15.3	14.4
5-9	18.7	19.2	14.7	16.1	19.8	20.0	19.9	23.7	18.9	16.4
10-14	18.0	18.4	15.2	16.0	22.4	17.8	18.2	19.1	20.9	16.3
15-19	17.7	17.3	16.9	19.2	20.2	18.3	16.1	15.6	19.4	20.0
20-24	13.2	12.6	15.4	18.2	11.8	15.4	11.5	9.8	11.8	16.5
25-29	7.0	6.9	10.3	9.7	5.0	6.9	6.6	5.2	5.5	7.5
30-34	4.3	4.4	6.6	3.4	2.4	4.0	4.6	4.0	3.3	3.9
35 or more	2.9	2.8	4.9	3.1	.9	3.3	2.5	2.0	2.3	3.4
No response	2.0	2.1	1.5	1.9	2.7	1.1	2.2	2.2	2.7	1.6
Sector of employment										
Business/Industry, total	32.4	27.6	45.6	12.0	58.0	31.7	20.3	32.8	11.2	56.1
Not self-employed	25.1	19.9	43.3	9.5	52.5	27.3	15.9	5.8	6.4	51.4
Self-employed	7.2	7.7	2.4	2.5	5.5	4.3	4.5	27.0	4.8	4.7
Educational institution	51.5	55.1	43.1	81.2	33.1	40.4	60.8	43.6	71.1	33.6
Univ./4-yr college	49.2	52.4	41.2	77.2	32.1	39.5	59.3	37.8	68.1	33.4
Other	2.2	2.6	2.0	4.0	1.0	.9	1.5	5.8	3.0	.2
Federal govt. (civilian)	6.5	6.6	6.6	4.5	4.1	16.5	7.9	2.4	6.7	6.1
State/Local govt	2.3	2.6	.6	.4	1.6	5.7	2.4	3.6	4.3	.7
Hospitals/Clinics	2.8	3.4	.7	**	.4	**	3.7	12.5	.4	**
Other non-profits	3.6	3.7	3.0	1.6	2.6	4.5	3.7	4.5	4.6	2.9
Other/No response	.9	1.0	.4	.4	.2	1.2	1.2	.6	1.9	.6
Primary work activity										
Research and development	37.1	35.5	50.8	25.2	33.3	44.1	49.1	11.5	19.1	45.4
Basic research	15.1	17.1	18.6	17.5	7.4	19.8	29.0	5.4	8.1	4.8
Applied research	17.4	15.8	26.8	6.5	11.1	23.0	18.7	5.5	10.7	25.0
Development	4.7	2.5	5.5	1.1	14.8	1.3	1.4	.5	.3	15.6
Management/Administration	16.4	15.4	17.2	7.7	20.2	19.1	15.1	11.6	17.1	21.3
of R&D	7.9	6.5	12.1	1.5	12.0	10.8	6.9	1.5	3.1	14.8
of Other	8.5	8.9	5.1	6.2	8.2	8.3	8.1	10.1	14.0	6.5
Teaching	25.1	26.7	20.6	55.4	18.0	17.4	19.0	22.2	47.5	17.0
Professional services	8.2	9.8	.8	.3	.2	.4	6.1	46.4	.9	.2
Rprt/Stat/Comput activ	2.9	3.0	1.3	5.8	17.4	2.8	1.9	1.1	3.7	2.1
Consulting	3.7	3.1	1.8	1.9	4.5	9.0	2.3	3.7	3.4	7.0
Other/No response	6.6	6.5	7.6	3.7	6.5	7.2	6.6	3.6	8.2	7.1

** Less than 0.05 percent

NOTES: All numbers in the table are estimates derived from a sample.

All doctoral scientists and engineers employed in a science or engineering (S&E) field were categorized by their field of employment when that information was available. When it was not or when the employment field was other than science or engineering, doctorate holders were categorized by their field of degree.

SOURCE: National Science Foundation/SRS, 1989 Survey of Doctorate Recipients

Table 30. Employed doctoral scientists and engineers, by field of degree and field of employment: 1989

Field of degree	Field of employment: Total	All sci.	Physical sci.	Math. sci.	Environ. sci.	Life sci.	Psycho-logists	Social sci.	All engineers	Non-S&E
Total	448,643	336,265	63,377	35,551	19,017	108,639	54,688	54,993	69,531	42,847
All science degrees	372,099	319,197	61,960	28,807	17,443	106,944	52,944	51,099	15,307	37,595
Physical scientists	87,027	69,593	57,136	3,613	2,506	6,091	53	194	10,602	6,832
Mathematical sci	25,815	22,065	215	20,694	106	785	25	240	1,893	1,857
Environmental sci	14,370	12,982	503	257	11,566	558	2	96	618	770
Life scientists	111,032	102,607	4,019	1,207	2,676	93,572	306	827	1,231	7,194
Psychologists	64,122	57,632	76	1,203	14	3,256	51,718	1,365	582	5,908
Social scientists	69,733	54,318	11	1,833	575	2,682	840	48,377	381	15,034
All engineering degrees	67,746	8,345	1,371	4,261	1,423	1,220	34	36	54,149	5,252
All non-S&E degrees	8,798	8,723	46	2,483	151	475	1,710	3,858	75	**

** Excluded from population by definition

NOTE: All numbers in the table are estimates derived from a sample.

SOURCE: National Science Foundation/SRS, 1989 Survey of Doctorate Recipients

Table 31. Median annual salaries of employed doctoral scientists and engineers, by demographic characteristics, race/ethnicity, and sex: 1989

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Characteristics	Total 1/			White			Asian/Pacific Islander		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Total	$54,600	$56,000	$44,800	$54,800	$56,300	$44,700	$55,000	$55,700	$45,800
Age									
Under 30	45,100	45,800	40,900	44,800	45,500	41,000	48,900	49,500	38,300
30-34	43,000	45,000	38,600	42,700	44,700	38,300	45,800	46,400	41,700
35-39	47,400	49,200	40,900	46,900	48,800	40,700	50,400	50,900	45,300
40-44	52,700	54,800	46,000	52,300	54,000	46,100	57,500	60,000	45,400
45-49	58,500	60,300	47,500	58,800	60,400	47,300	58,300	59,100	49,900
50-54	60,900	62,000	49,100	61,100	62,200	49,500	60,400	60,800	47,400
55-59	62,000	63,500	48,300	62,500	64,000	48,300	60,600	60,800	47,500
60-64	62,200	63,500	50,900	63,200	64,400	52,200	55,500	55,700	**
65 or over	65,900	66,900	53,900	66,000	67,000	53,600	61,700	61,600	**
No response	51,700	53,100	44,100	50,000	52,600	42,400	**	**	**
Citizenship									
U.S. native-born	53,900	55,800	44,500	54,100	55,800	44,500	50,500	53,400	44,500
U.S. naturalized	60,100	60,600	48,900	61,700	63,600	50,500	58,500	59,900	48,100
Non-U.S. perm. resident	52,600	53,900	44,400	54,900	56,400	45,400	51,500	52,600	43,000
Non-U.S. temp. resident	40,700	40,700	40,600	42,100	42,100	42,200	42,300	42,500	39,300
No response	**	**	**	**	**	**	**	**	**
Geographic division									
New England	55,300	58,100	44,400	55,400	58,400	44,200	54,300	55,200	46,000
Middle Atlantic	57,100	60,100	47,300	57,400	60,400	47,300	57,300	58,800	48,500
East North Central	53,300	55,400	43,100	53,400	55,500	42,800	54,100	55,100	44,600
West North Central	48,900	50,500	40,700	48,900	50,500	40,600	48,600	48,900	43,500
South Atlantic	54,800	56,300	44,900	55,100	56,800	44,800	52,900	54,200	45,000
East South Central	50,000	50,800	42,300	50,200	51,000	42,400	47,100	47,600	44,000
West South Central	50,700	52,700	41,200	50,600	52,300	41,500	58,600	60,100	40,800
Mountain	52,000	54,400	40,500	52,500	54,900	40,500	51,200	51,300	39,900
Pacific	58,400	60,400	47,600	58,800	60,600	47,600	56,500	58,500	48,100
Other U.S.	36,800	38,500	34,600	38,100	38,700	35,400	**	**	**
Field of degree									
SCIENTISTS	52,600	55,000	44,600	52,800	55,200	44,600	51,600	52,900	45,300
Physical scientists	58,500	59,800	48,400	59,000	60,100	48,200	55,400	57,100	49,000
Chemists	56,700	57,900	48,100	57,300	58,500	47,900	52,800	54,400	49,000
Physicists/Astronomers	60,400	60,600	50,500	60,500	60,700	50,700	59,700	60,200	49,200
Mathematical scientists	55,100	55,700	47,200	55,300	56,000	46,500	50,800	50,800	50,900
Mathematicians	54,500	55,400	46,200	55,000	55,600	45,500	50,700	50,800	48,400
Statisticians	59,400	59,600	57,000	60,100	60,200	55,800	57,000	**	**
Computer/Information spec	61,400	61,700	57,900	63,300	64,000	57,900	56,600	56,600	57,500
Environmental scientists	53,700	54,900	43,800	53,700	54,900	43,600	55,200	55,600	48,500
Earth scientists	54,300	55,300	42,900	54,100	55,200	43,000	58,400	61,000	**
Oceanographers	50,300	50,700	44,700	50,200	50,600	44,700	55,300	55,300	**
Atmospheric scientists	57,400	57,900	51,100	58,500	59,000	48,500	46,800	42,800	**
Life scientists	50,500	52,600	42,800	50,600	52,800	42,700	50,000	50,900	43,500
Biological scientists	50,500	52,600	42,500	50,600	52,800	42,500	48,800	51,200	42,500
Agricultural scientists	48,100	49,300	40,500	48,400	50,000	40,500	47,200	47,500	40,200
Medical scientists	53,000	58,900	44,700	53,100	59,800	44,300	54,300	58,100	50,100
Psychologists	50,100	51,600	44,500	50,200	51,800	44,700	43,900	48,300	42,100
Social scientists	50,500	52,300	44,500	50,700	52,900	44,700	47,700	49,200	42,400
Economists	58,200	59,500	47,700	58,800	60,000	47,800	52,000	52,300	45,300
Sociologists/Anthropol	45,700	47,100	42,100	46,100	47,700	42,100	41,700	41,800	41,000
Other social scientists	48,900	50,600	42,900	49,300	50,800	44,000	47,600	49,400	37,100
ENGINEERS	62,400	62,700	52,800	63,900	64,600	52,900	59,300	59,500	52,500
Aeronautical/Astron	60,900	60,900	**	62,400	62,400	**	56,900	56,900	**
Chemical	62,200	63,100	50,600	64,000	65,100	50,900	60,100	60,200	48,800
Civil	61,000	61,400	50,500	61,700	62,000	50,900	58,600	58,800	**
Electrical/Electronic	72,600	72,800	65,100	74,800	75,000	65,600	61,900	61,800	**
Materials science	61,000	61,200	53,000	61,700	61,900	53,900	59,000	59,000	**
Mechanical	62,200	62,300	55,300	62,900	63,300	56,000	52,400	52,400	**
Nuclear	63,100	63,500	57,500	63,800	65,000	60,200	62,700	**	**
Systems design	67,300	68,100	57,600	69,100	70,000	58,100	67,400	**	**
Other	57,800	58,200	50,700	59,500	59,900	50,300	55,000	55,100	54,000
Other fields	46,000	48,000	41,700	46,200	48,000	41,500	48,500	**	**
Place of birth									
U.S.	53,800	55,700	44,400	54,100	55,800	44,400	49,700	50,900	44,800
Canada	60,200	63,300	46,000	60,000	63,000	45,900	**	**	**
Latin & South America	51,200	55,700	45,400	51,000	54,700	45,400	**	**	**
North,Central,West Europe	61,000	63,100	47,700	61,100	63,200	47,800	**	**	**
Eastern Europe	61,100	61,800	48,700	61,000	61,800	48,700	**	**	**
Eastern Asia	55,200	55,900	46,700	52,200	55,000	**	55,200	56,000	46,900
Western Asia	55,400	55,700	45,500	55,700	56,300	46,400	55,200	55,500	44,600
Australasia 2/	50,900	55,400	45,500	51,800	53,800	47,600	50,500	55,700	42,300
Africa	51,700	51,900	40,900	55,900	56,400	45,600	**	**	**
No response	55,600	56,500	50,600	55,300	56,100	50,400	56,500	56,700	**

[Continued]

Table 31. Median annual salaries of employed doctoral scientists and engineers, by demographic characteristics, race/ethnicity, and sex: 1989

Characteristics	Black			Native American			Hispanic 3/		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Total	$48,500	$51,200	$44,400	$50,100	$51,500	$43,500	$50,000	$50,900	$42,700
Age									
Under 30	**	**	**	**	**	**	**	**	**
30-34	36,500	36,300	37,400	48,200	51,300	**	37,600	37,500	38,400
35-39	42,200	42,700	40,600	44,700	**	**	46,100	46,800	40,900
40-44	48,900	51,200	45,200	56,000	65,200	**	49,100	52,400	44,200
45-49	51,400	51,800	47,800	48,900	**	**	55,600	59,300	48,600
50-54	55,600	58,300	48,100	**	**	**	55,900	56,200	**
55-59	57,400	58,500	48,600	**	**	**	70,900	75,300	**
60-64	51,100	51,500	**	**	**	**	55,100	**	**
65 or over	**	**	**	**	**	**	**	**	**
No response	**	**	**	**	**	**	**	**	**
Citizenship									
U.S. native-born	48,700	52,300	44,600	49,500	51,300	42,200	50,100	52,300	40,400
U.S. naturalized	48,400	55,400	47,400	**	**	**	52,000	52,900	48,700
Non-U.S. perm. resident	51,000	51,200	**	**	**	**	47,300	47,800	42,600
Non-U.S. temp. resident	**	**	**	**	**	**	32,900	**	**
No response	**	**	**	**	**	**	**	**	**
Geographic division									
New England	51,100	56,800	45,500	**	**	**	56,500	65,600	43,600
Middle Atlantic	50,500	52,500	44,900	**	**	**	52,800	62,700	46,000
East North Central	46,600	46,800	45,300	**	**	**	49,800	50,400	43,000
West North Central	50,700	55,100	**	**	**	**	55,100	55,500	**
South Atlantic	48,700	51,700	45,300	**	**	**	50,300	50,900	44,500
East South Central	47,000	47,500	40,500	**	**	**	40,800	45,600	**
West South Central	40,000	41,700	39,000	**	**	**	49,900	51,900	37,100
Mountain	50,500	**	44,400	40,800	**	**	45,600	48,200	39,700
Pacific	59,300	63,200	45,900	55,800	61,300	**	48,900	49,200	48,700
Other U.S.	**	**	**	**	**	**	36,300	38,300	34,000
Field of degree									
SCIENTISTS	46,500	48,700	44,300	48,900	51,200	44,200	48,700	50,500	42,500
Physical scientists	50,800	50,800	50,500	51,800	51,800	**	58,800	60,300	43,100
Chemists	49,200	48,500	51,000	**	**	**	58,600	63,900	40,500
Physicists/Astronomers	55,700	56,100	**	**	**	**	59,000	59,100	**
Mathematical scientists	50,800	52,000	**	**	**	**	48,200	51,000	**
Mathematicians	50,100	50,500	**	**	**	**	48,200	51,000	**
Statisticians	**	**	**	**	**	**	**	**	**
Computer/Information spec	**	**	**	**	**	**	65,300	62,000	**
Environmental scientists	**	**	**	**	**	**	49,300	49,400	**
Earth scientists	**	**	**	**	**	**	49,300	49,200	**
Oceanographers	**	**	**	**	**	**	**	**	**
Atmospheric scientists	**	**	**	**	**	**	**	**	**
Life scientists	45,900	46,500	44,600	52,000	**	39,000	45,700	48,600	40,500
Biological scientists	46,300	46,800	44,600	**	**	**	47,600	50,000	38,700
Agricultural scientists	43,300	45,100	**	**	**	**	41,000	39,700	43,600
Medical scientists	45,600	45,800	45,500	**	**	**	53,800	70,500	44,200
Psychologists	44,300	46,500	42,600	48,500	**	**	45,500	49,900	41,200
Social scientists	47,500	49,200	44,900	48,100	**	**	45,200	46,500	44,100
Economists	50,800	**	**	**	**	**	60,900	72,100	**
Sociologists/Anthropol	45,800	49,900	44,200	**	**	**	39,700	**	40,300
Other social scientists	47,500	47,900	45,000	**	**	**	44,100	40,600	44,600
ENGINEERS	55,700	55,900	**	**	**	**	55,500	55,700	48,300
Aeronautical/Astron	**	**	**	**	**	**	**	**	**
Chemical	**	**	**	**	**	**	55,600	**	**
Civil	**	**	**	**	**	**	50,800	50,700	**
Electrical/Electronic	**	**	**	**	**	**	**	**	**
Materials science	**	**	**	**	**	**	**	**	**
Mechanical	**	**	**	**	**	**	**	**	**
Nuclear	**	**	**	**	**	**	**	**	**
Systems design	**	**	**	**	**	**	**	**	**
Other	62,200	62,400	**	**	**	**	56,900	56,900	**
Other fields	45,500	**	**	**	**	**	41,800	**	**
Place of birth									
U.S.	48,400	52,000	44,400	49,300	51,300	40,900	50,000	52,200	40,200
Canada	**	**	**	**	**	**	**	**	**
Latin & South America	60,300	63,400	44,800	**	**	**	49,800	51,200	44,500
North,Central,West Europe	**	**	**	**	**	**	50,700	50,400	**
Eastern Europe	**	**	**	**	**	**	**	**	**
Eastern Asia	**	**	**	**	**	**	**	**	**
Western Asia	**	**	**	**	**	**	**	**	**
Australasia 2/	**	**	**	**	**	**	**	**	**
Africa	41,300	41,400	**	**	**	**	**	**	**
No response	56,900	**	**	**	**	**	**	**	**

** Median salaries were not computed for groups with fewer than 20 individuals reporting salary.

1/ Totals include individuals whose race was specified as "other" and individuals from whom no response was received.
2/ Australasia comprises Australia, New Zealand, Indonesia, and the Philippines.
3/ Individuals who are included in the ethnic category "Hispanic" also may have been included in one of the race categories.

NOTES: All numbers in the table are estimates derived from a sample.

Median salaries were computed only for full-time employed civilians.

SOURCE: National Science Foundation/SRS, 1989 Survey of Doctorate Recipients

Table 32. Median annual salaries of employed doctoral scientists and engineers, by demographic characteristics and citizenship status: 1989

Characteristics	Citizenship						
		U.S.			Non-U.S.		
	Total 1/	Total	Native	Natlzd	Total	Perm res	Temp res
Total	$54,600	$55,000	$53,900	$60,100	$50,900	$52,600	$40,700
Sex							
Men	56,000	56,500	55,800	60,600	52,300	53,900	40,700
Women	44,800	44,900	44,500	48,900	43,200	44,400	40,600
Race							
White	54,800	54,800	54,100	61,700	53,300	54,900	42,100
Asian/Pacific Islander	55,000	57,100	50,500	58,500	49,200	51,500	42,300
Black	48,500	48,700	48,700	48,400	43,700	51,000	**
Native American	50,100	50,100	49,500	**	**	**	**
Other	49,500	50,200	50,600	**	**	**	**
No response	48,100	48,400	48,400	**	**	**	**
Ethnicity							
Hispanic	50,000	50,500	50,100	52,000	46,400	47,300	32,900
Non-Hispanic	54,700	55,000	54,000	60,200	51,300	52,700	41,700
No response	53,400	53,900	52,900	60,500	44,500	53,200	**
Age							
Under 30	45,100	44,800	45,100	42,500	48,300	49,800	46,100
30-34	43,000	42,700	42,500	48,100	45,000	46,800	40,200
35-39	47,400	47,000	46,200	52,300	49,200	50,200	40,100
40-44	52,700	52,700	52,000	58,400	53,100	53,300	**
45-49	58,500	58,600	58,300	60,000	58,200	58,400	**
50-54	60,900	60,900	60,800	61,800	58,600	58,600	**
55-59	62,000	61,800	61,600	64,400	67,600	67,300	**
60-64	62,200	62,300	61,900	64,300	58,300	60,200	**
65 or over	65,900	66,000	65,500	70,700	**	**	**
No response	51,700	49,600	50,600	37,500	**	**	**
Geographic division							
New England	55,300	55,600	55,000	61,400	48,600	50,200	35,700
Middle Atlantic	57,100	58,000	56,400	64,400	53,500	55,000	48,100
East North Central	53,300	53,700	52,700	59,600	49,600	51,000	41,400
West North Central	48,900	48,900	48,600	52,900	48,900	50,700	**
South Atlantic	54,800	54,800	54,700	55,500	54,100	55,400	42,300
East South Central	50,000	50,100	49,400	55,700	47,000	47,100	**
West South Central	50,700	50,800	50,400	60,100	47,400	51,200	**
Mountain	52,000	52,500	51,900	56,500	47,400	47,600	**
Pacific	58,400	58,900	58,200	60,800	52,600	56,100	38,600
Other U.S.	36,800	36,700	36,000	**	**	**	**
Field of degree							
SCIENTISTS	52,600	52,800	52,300	57,600	48,900	50,500	38,400
Physical scientists	58,500	58,900	58,200	61,100	52,100	56,100	34,900
Chemists	56,700	57,000	56,300	60,600	47,400	51,200	**
Physicists/Astronomers	60,400	60,600	60,500	62,100	55,600	58,000	36,500
Mathematical scientists	55,100	55,600	55,100	59,200	46,100	49,100	**
Mathematicians	54,500	55,300	54,300	60,800	45,200	49,100	**
Statisticians	59,400	59,500	60,700	54,100	**	**	**
Computer/Information spec	61,400	62,700	62,900	61,600	58,600	61,500	**
Envlronmental scientists	53,700	53,700	53,200	60,400	50,700	56,000	**
Earth scientists	54,300	54,100	53,500	61,400	56,600	57,100	**
Oceanographers	50,300	50,400	49,500	55,800	**	**	**
Atmospheric scientists	57,400	58,100	58,000	59,100	**	**	**
Life scientists	50,500	50,600	50,400	55,300	46,200	48,200	34,900
Biological scientists	50,500	50,600	50,400	53,600	47,500	48,600	**
Agricultural scientists	48,100	48,600	48,400	50,400	40,000	39,700	**
Medical scientists	53,000	53,300	52,300	62,400	50,100	50,500	**
Psychologists	50,100	50,100	50,100	51,800	45,700	49,700	**
Social scientists	50,500	50,600	50,500	51,700	48,000	48,300	42,100
Economists	58,200	58,000	58,200	55,500	60,400	60,100	**
Sociologists/Anthropol	45,700	45,900	45,900	48,300	38,800	37,900	**
Other social scientists	48,900	49,600	49,100	51,200	45,000	46,600	**
ENGINEERS	62,400	64,400	64,600	63,800	53,500	55,300	44,800
Aeronautical/Astron	60,900	62,800	62,100	73,200	**	**	**
Chemical	62,200	64,600	63,300	65,400	55,400	55,700	**
Civil	61,000	61,400	62,400	58,400	55,400	63,000	40,600
Electrical/Electronic	72,600	73,600	75,200	67,700	61,200	61,500	**
Materials science	61,000	62,500	61,600	63,600	53,200	53,700	**
Mechanical	62,200	63,500	64,100	60,100	48,700	51,600	**
Nuclear	63,100	65,500	63,800	68,100	**	**	**
Systems design	67,300	70,500	67,600	80,500	**	**	**
Other	57,800	60,200	60,200	60,200	52,900	55,200	48,100
Other fields	46,000	46,700	46,700	45,600	38,900	**	**
Place of birth							
U.S.	53,800	53,800	53,800	**	**	**	**
Canada	60,200	61,200	53,200	62,800	58,500	60,100	**
Latin & South America	51,200	52,300	45,600	54,600	49,100	51,700	40,800
North,Central,West Europe	61,000	64,500	55,000	65,400	56,500	57,700	42,400
Eastern Europe	61,100	64,500	**	63,600	52,700	53,700	36,200
Eastern Asia	55,200	57,400	49,500	57,600	48,100	50,300	39,700
Western Asia	55,400	59,100	**	59,100	50,600	51,000	45,900
Australasia 2/	50,900	65,200	**	65,500	48,300	49,600	**
Africa	51,700	55,900	**	56,400	48,500	50,900	36,200
No response	55,600	55,700	55,900	52,300	54,400	55,000	**

** Median salaries were not computed for groups with fewer than 20 individuals reporting salary.

1/ Total(s) include(s) individuals for whom citizenship was unspecified and from whom no response was received.

2/ Australasia comprises Australia, New Zealand, Indonesia, and the Philippines.

NOTES: All numbers in the table are estimates derived from a sample.

Median salaries were computed only for full-time employed civilians.

SOURCE: National Science Foundation/SRS, 1989 Survey of Doctorate Recipients

Table 33. Median annual salaries of employed doctoral scientists and engineers, by demographic characteristics and employment sector: 1989

Characteristics	Total 1/ employed	Education		Business/Industry			Government		Non-profit 2/
		Total	Univ./ 4-yr coll	Total	Not self-emp	Self-emp	Federal civilian	State/ Local	
Total	$54,600	$50,900	$51,200	$61,500	$60,900	$70,400	$53,900	$42,800	$48,000
Sex									
Men	56,000	52,700	53,100	63,100	62,400	73,600	55,100	42,800	51,800
Women	44,800	42,400	42,200	52,400	50,900	60,200	45,900	42,800	40,100
Race									
White	54,800	51,000	51,300	62,700	62,200	70,600	54,400	42,900	47,900
Asian/Pacific Islander	55,000	51,100	51,300	58,800	58,800	60,000	50,400	40,500	50,400
Black	48,500	45,400	45,700	58,900	57,200	62,000	53,300	44,800	42,900
Native American	50,100	48,300	48,400	65,600	65,200	**	**	**	**
Other	49,500	46,200	46,300	**	**	**	**	**	**
No response	48,100	46,300	42,400	49,300	49,200	**	**	**	**
Ethnicity									
Hispanic	50,000	44,900	44,900	60,900	61,000	60,600	50,800	39,700	45,400
Non-Hispanic	54,700	51,000	51,300	61,500	60,900	70,500	54,000	42,900	47,800
No response	53,400	48,300	48,100	65,100	60,600	**	50,600	**	56,500
Age									
Under 30	45,100	44,500	44,300	46,300	46,400	**	**	**	**
30-34	43,000	38,400	38,400	49,200	49,100	50,700	38,700	34,700	39,600
35-39	47,400	42,000	42,000	57,000	55,800	70,800	42,700	40,000	42,300
40-44	52,700	47,000	47,300	63,700	63,100	72,400	50,500	42,900	48,700
45-49	58,500	53,900	54,600	70,000	69,500	70,700	56,400	41,600	54,700
50-54	60,900	58,200	58,800	70,300	70,500	60,800	58,000	46,000	60,800
55-59	62,000	59,000	59,900	72,800	72,900	72,200	64,600	52,300	54,200
60-64	62,200	61,000	61,300	71,400	72,100	70,100	62,400	48,100	63,500
65 or over	65,900	66,400	67,000	65,800	66,400	65,000	67,600	**	53,900
No response	51,700	48,700	51,100	55,000	53,700	**	**	**	**
Citizenship									
U.S. native-born	53,900	50,500	50,700	62,300	61,500	70,500	54,100	42,900	46,800
U.S. naturalized	60,100	57,600	58,300	63,100	62,900	70,200	52,800	45,000	56,300
Non-U.S. perm. resident	52,600	50,300	50,500	56,700	56,500	70,700	**	39,000	53,100
Non-U.S. temp. resident	40,700	36,800	36,800	44,500	44,300	**	**	**	**
No response	**	**	**	**	**	**	**	**	**
Geographic division									
New England	55,300	52,600	53,100	61,300	60,800	70,600	61,100	46,200	48,400
Middle Atlantic	57,100	52,800	52,900	65,000	63,900	75,500	49,800	46,400	46,400
East North Central	53,300	50,900	51,100	60,000	58,900	70,900	50,000	42,900	48,700
West North Central	48,900	47,300	47,400	58,400	58,500	56,300	50,800	35,800	44,100
South Atlantic	54,800	51,100	51,500	60,700	60,300	70,600	55,700	45,900	51,600
East South Central	50,000	46,700	46,700	58,700	57,600	82,300	50,300	**	49,500
West South Central	50,700	46,700	47,300	64,000	62,900	70,900	50,700	36,400	45,500
Mountain	52,000	51,200	51,400	60,400	60,600	60,100	52,000	38,500	41,500
Pacific	58,400	55,400	55,700	63,600	63,700	60,900	51,100	43,500	50,100
Other U.S.	36,800	33,700	33,400	**	**	**	**	**	**
Place of birth									
U.S.	53,800	50,400	50,600	62,300	61,700	70,600	54,200	43,100	47,000
Canada	60,200	58,400	58,700	65,800	65,800	**	**	**	**
Latin & South America	51,200	46,200	46,400	63,800	63,800	65,500	59,100	**	44,100
North,Central,West Europe	61,000	60,000	60,400	68,300	66,700	70,400	50,700	**	54,200
Eastern Europe	61,100	58,900	59,800	66,200	61,400	**	65,800	**	50,500
Eastern Asia	55,200	52,800	53,100	57,300	57,200	60,100	51,400	40,500	45,600
Western Asia	55,400	51,400	51,600	60,800	60,800	77,100	47,400	35,900	62,100
Australasia 3/	50,900	49,100	49,100	70,100	66,700	**	**	**	**
Africa	51,700	50,300	50,300	57,000	57,100	**	**	**	**
No response	55,600	55,600	55,600	56,400	56,400	60,300	60,400	**	54,300

** Median salaries were not computed for groups with fewer than 20 individuals reporting salary.

1/ Totals include individuals who work in employment sectors other than education, business/industry, government, and nonprofit organizations; they also include individuals from whom no response was received.
2/ "Nonprofit" [organizations] include hospitals and clinics.
3/ Australasia comprises Australia, New Zealand, Indonesia, and the Philippines.

NOTES: All numbers in the table are estimates derived from a sample.

Median salaries were computed only for full-time employed civilians.

SOURCE: National Science Foundation/SRS, 1989 Survey of Doctorate Recipients

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Table 34. Median annual salaries of employed doctoral scientists and engineers, by demographic characteristics and primary work activity: 1989

Characteristics	Total employed	Research & Development				Management/Admin			Teaching	Prof. Serv.	Consulting	Other/ No resp
		Total	Basic	App'd	Devlop/ Design	Total	of R&D	of Other				
Total	$54,600	$54,500	$51,900	$54,600	$59,300	$66,800	$72,800	$60,500	$48,400	$50,800	$60,800	$53,400
Sex												
Men	56,000	55,600	54,200	55,500	60,000	70,100	74,300	64,300	50,200	54,000	62,600	55,600
Women	44,800	45,300	42,500	47,000	50,500	50,700	57,900	48,300	41,200	45,600	46,500	42,600
Race												
White	54,800	54,700	52,200	54,700	60,300	66,800	72,900	60,600	48,300	50,800	60,900	54,000
Asian/Pacific Islander	55,000	54,200	49,200	54,300	56,000	70,600	72,400	64,700	51,200	65,000	55,000	52,200
Black	48,500	48,900	50,200	48,000	**	58,500	69,400	54,000	42,900	45,000	63,200	51,500
Native American	50,100	55,300	51,600	60,500	**	54,600	**	**	48,100	**	**	**
Other	49,500	49,900	**	**	**	**	**	**	**	**	**	**
No response	48,100	48,800	48,200	50,000	**	**	**	**	39,900	**	**	**
Ethnicity												
Hispanic	50,900	50,100	50,300	49,500	54,100	60,600	70,200	52,200	43,500	45,900	80,200	55,700
Non-Hispanic	54,700	54,600	51,900	54,700	59,500	66,900	72,900	60,600	48,500	50,800	60,800	53,200
No response	53,400	53,900	53,700	54,900	50,700	65,700	69,500	58,500	41,500	54,800	**	58,000
Age												
Under 30	45,100	46,300	46,400	45,900	48,700	**	**	**	35,300	**	40,900	36,100
30-34	43,000	45,400	40,400	47,000	49,300	49,400	52,600	42,100	36,900	37,300	47,100	42,100
35-39	47,400	48,600	44,800	50,200	55,100	59,600	63,500	50,200	39,500	46,200	53,200	45,900
40-44	52,700	54,500	50,900	54,800	60,000	63,500	69,200	53,900	42,700	50,900	63,700	54,800
45-49	58,500	60,400	60,400	60,000	60,800	68,900	75,900	60,700	48,800	60,300	66,900	55,900
50-54	60,900	62,700	63,400	61,100	65,400	72,500	75,500	67,900	53,200	60,100	64,400	57,300
55-59	62,000	68,100	70,800	64,800	67,600	73,800	77,000	67,600	55,500	60,100	65,500	56,300
60-64	62,200	65,700	71,100	64,300	60,600	72,400	75,500	68,800	57,000	54,200	60,500	60,500
65 or over	65,900	70,500	75,600	68,200	61,400	74,600	75,700	72,600	63,200	55,600	65,900	55,600
No response	51,700	54,900	56,000	55,000	**	**	**	**	43,800	**	**	**
Citizenship												
U.S. native-born	53,900	54,100	51,500	54,200	60,200	65,900	72,500	60,100	47,900	50,600	60,700	53,200
U.S. naturalized	60,100	59,700	60,100	60,000	57,900	75,000	75,500	72,000	55,200	60,600	70,000	54,900
Non-U.S. perm. resident	52,600	51,900	50,800	51,400	53,800	70,200	70,300	68,300	50,200	53,500	63,200	52,500
Non-U.S. temp. resident	40,700	40,600	36,300	44,100	**	**	**	**	38,100	**	**	60,100
No response	**	**	**	**	**	**	**	**	**	**	**	**
Geographic division												
New England	55,300	55,300	50,500	56,400	60,300	68,100	76,700	63,200	51,500	48,800	66,800	56,300
Middle Atlantic	57,100	56,600	54,300	57,100	60,100	72,400	78,800	65,700	51,100	50,900	70,000	57,100
East North Central	53,300	54,300	53,100	53,700	56,700	65,600	70,800	60,300	48,200	52,500	50,900	50,800
West North Central	48,900	49,400	48,100	50,000	50,100	60,800	65,300	57,100	45,200	48,400	60,200	46,100
South ATlantic	54,800	52,900	51,300	52,900	58,100	66,200	70,000	61,200	47,600	50,600	65,200	53,500
East South Central	50,000	49,400	48,200	50,300	**	60,300	65,600	55,100	44,500	55,000	**	53,100
West South Central	50,700	52,300	49,600	52,800	60,300	67,000	75,200	63,200	42,800	49,300	70,500	52,500
Mountain	52,000	54,700	50,800	54,900	55,900	58,500	67,800	51,800	48,500	50,200	60,700	48,400
Pacific	58,400	55,900	53,600	55,500	60,500	70,800	75,800	60,600	55,200	58,600	60,200	55,700
Other U.S.	36,800	38,200	**	**	**	38,000	**	50,000	29,800	**	**	**
Place of birth												
U.S.	53,800	54,000	51,500	54,100	60,300	65,900	72,600	60,100	47,700	50,700	60,700	53,200
Canada	60,200	59,900	52,000	65,000	**	65,800	**	72,100	54,500	**	**	**
Latin & South America	51,200	48,700	45,700	48,800	**	70,400	70,400	65,900	46,300	50,300	**	55,500
North,Central,West Europe	61,000	60,100	60,400	60,000	59,900	76,300	80,400	70,900	55,600	56,900	75,100	57,500
Eastern Europe	61,100	60,600	55,800	63,000	**	66,700	66,800	**	58,700	**	**	50,800
Eastern Asia	55,200	54,300	47,800	55,100	55,800	68,900	69,700	62,000	53,700	80,000	49,700	51,400
Western Asia	55,400	54,500	50,800	55,000	56,400	73,600	72,700	73,700	49,700	65,600	64,200	60,200
Australasia 1/	50,900	49,200	47,600	49,800	**	72,600	**	**	50,500	**	**	47,700
Africa	51,700	55,200	55,200	50,500	**	**	**	**	49,300	**	**	51,700
No response	55,600	56,600	56,700	55,900	57,700	60,300	63,500	57,900	52,500	45,600	**	57,500

** Median salaries were not computed for groups with fewer than 20 individuals reporting salary.

1/ Australasia comprises Australia, New Zealand, Indonesia, and the Philippines.

NOTES: All numbers in the table are estimates derived from a sample.

Median salaries were computed only for full-time employed civilians.

SOURCE: National Science Foundation/SRS, 1989 Survey of Doctorate Recipients

Table 35. Median annual salaries of employed doctoral scientists and engineers, by demographic characteristics and broad field: 1989

Characteristics	Total	All sci.	Physical sci.	Math. sci.	Computer inf.spec.	Environ. sci.	Life sci.	Psycho-logists	Social sci.	All engineers
Total	$54,600	$52,200	$56,000	$51,600	$58,500	$55,100	$50,700	$50,100	$50,400	$62,500
Sex										
Men	56,000	54,500	57,100	52,200	60,100	55,600	53,200	51,300	52,000	62,900
Women	44,800	44,400	47,500	45,200	50,000	43,600	43,100	44,300	44,200	53,400
Race										
White	54,800	52,400	56,700	51,900	58,300	54,800	50,800	50,200	50,600	64,300
Asian/Pacific Islander	55,000	51,700	52,500	47,900	60,100	55,900	50,400	44,200	48,200	58,400
Black	48,500	47,200	50,100	44,500	**	63,400	46,300	44,400	47,200	55,700
Native American	50,100	48,700	51,300	**	**	**	51,100	48,500	48,000	**
Other	49,500	49,200	**	**	**	**	**	**	**	**
No response	48,100	45,500	**	**	**	**	50,500	**	42,100	**
Ethnicity										
Hispanic	50,000	48,300	54,300	44,000	56,900	49,300	50,100	45,700	44,300	55,400
Non-Hispanic	54,700	52,200	56,200	51,500	58,500	55,200	50,700	50,000	50,500	62,700
No response	53,400	52,300	49,100	**	**	50,900	49,400	55,600	48,700	58,500
Age										
Under 30	45,100	40,900	42,800	**	53,800	**	32,200	35,600	**	48,100
30-34	43,000	40,900	45,400	39,300	55,000	38,700	36,500	37,200	42,000	50,600
35-39	47,400	45,300	50,600	44,400	57,800	43,500	42,700	45,100	41,700	55,500
40-44	52,700	50,600	55,900	50,800	58,300	54,000	49,700	49,600	46,200	62,700
45-49	58,500	55,700	60,500	52,000	60,300	58,600	54,700	52,700	53,400	69,600
50-54	60,900	58,600	62,000	58,100	57,700	63,400	58,300	54,000	54,700	70,400
55-59	62,000	60,200	63,800	61,100	67,300	65,600	60,100	56,500	55,400	70,900
60-64	62,200	61,100	65,500	63,100	69,500	65,100	61,400	58,000	58,700	67,700
65 or over	65,900	64,500	65,600	68,600	**	61,100	63,800	58,800	66,500	74,100
No response	51,700	45,900	**	**	**	**	44,000	**	**	56,000
Citizenship										
U.S. native-born	53,900	51,900	55,900	51,600	58,300	53,900	50,500	50,000	50,400	64,800
U.S. naturalized	60,100	57,400	60,400	59,100	60,600	63,200	56,400	51,000	51,600	63,200
Non-U.S. perm. resident	52,600	50,900	53,400	47,400	60,100	58,900	47,900	48,900	48,900	55,200
Non-U.S. temp. resident	40,700	38,200	34,900	38,500	**	**	34,400	**	44,400	46,100
No response	**	**	**	**	**	**	**	**	**	**
Geographic division										
New England	55,300	53,500	58,400	58,700	60,400	50,200	50,800	49,200	49,800	65,700
Middle Atlantic	57,100	55,500	57,700	54,500	60,700	55,000	55,500	51,400	52,700	65,500
East North Central	53,300	51,700	55,200	51,400	55,700	53,700	52,000	47,700	48,500	61,500
West North Central	48,900	47,700	50,900	47,200	48,200	44,400	48,300	43,100	45,800	62,100
South Atlantic	54,800	53,100	55,900	51,700	60,000	55,400	50,700	50,300	55,400	60,800
East South Central	50,000	47,500	51,200	44,300	47,900	40,700	48,100	50,200	46,200	57,200
West South Central	50,700	48,600	52,000	46,000	55,400	62,700	46,900	45,800	42,700	62,100
Mountain	52,000	50,000	56,500	52,200	52,000	53,400	44,900	48,000	47,900	61,300
Pacific	58,400	55,700	60,600	55,500	62,100	58,200	53,400	52,200	51,700	65,100
Other U.S.	36,800	35,100	34,300	**	**	**	33,300	**	**	80,100
Place of Birth										
U.S.	53,800	51,800	55,800	51,500	58,400	53,800	50,500	50,000	50,200	64,900
Canada	60,200	58,500	63,600	**	**	48,700	58,200	56,200	54,700	68,300
Latin & South America	51,200	49,700	52,200	43,100	59,100	63,400	45,700	45,900	47,200	58,500
North,Central,West Europe	61,000	60,300	65,100	63,100	58,100	62,700	56,000	50,700	60,600	65,900
Eastern Europe	61,100	60,200	60,900	63,700	68,900	**	60,900	**	55,600	62,400
Eastern Asia	55,200	52,400	53,500	48,800	60,500	53,600	49,600	46,500	47,800	57,900
Western Asia	55,400	52,000	47,900	46,900	56,500	66,700	52,800	43,700	51,400	58,500
Australasia 1/	50,900	50,300	57,400	**	**	**	53,100	**	**	**
Africa	51,700	50,000	**	**	**	**	50,400	**	40,300	56,100
No response	55,600	54,900	59,300	**	56,800	61,500	52,300	53,300	54,500	56,500

** Median salaries were not computed for groups with fewer than 20 individuals reporting salary.

1/ Australasia comprises Australia, New Zealand, Indonesia, and the Philippines.

NOTES: All numbers in the table are estimates derived from a sample.

Median salaries were computed only for full-time employed civilians.

All doctoral scientists and engineers employed in a science or engineering (S&E) field were categorized by their field of employment when that information was available. When it was not or when the employment field was other than science or engineering, doctorate holders were categorized by their field of degree.

SOURCE: National Science Foundation/SRS, 1989 Survey of Doctorate Recipients

Table 36. Median annual salaries of employed doctoral scientists and engineers, by employment-related characteristics, race/ethnicity, and sex: 1989

[Page 1 of 2]

Characteristics	Total 1/			White			Asian/Pacific Islander		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Total	$54,600	$56,000	$44,800	$54,800	$56,300	$44,700	$55,000	$55,700	$45,800
Field 2/									
SCIENTISTS	52,200	54,500	44,400	52,400	54,800	44,400	51,700	53,000	45,100
Physical scientists	56,000	57,100	47,500	56,700	57,800	47,100	52,500	53,300	48,500
Chemists	55,000	55,900	46,900	55,700	56,800	46,500	52,000	52,400	49,100
Physicists/Astronomers	58,600	59,100	48,700	58,700	59,100	49,600	57,300	60,000	48,000
Mathematical scientists	51,600	52,200	45,200	51,900	52,700	44,800	47,900	48,000	47,000
Mathematicians	51,600	52,400	43,800	51,800	52,500	43,600	48,600	50,000	47,000
Statisticians	51,500	51,700	48,300	52,900	53,500	48,500	47,700	47,700	46,900
Computer/Information spec	58,500	60,100	50,000	58,300	60,100	48,900	60,100	60,400	52,200
Environmental scientists	55,100	55,600	43,600	54,800	55,400	43,400	55,900	56,900	48,300
Earth scientists	55,700	57,000	42,500	55,400	56,000	42,200	60,900	63,100	**
Oceanographers	50,600	50,900	45,000	50,600	50,800	45,300	55,100	**	**
Atmospheric scientists	53,300	53,600	51,100	54,600	55,500	51,400	48,100	48,200	**
Life scientists	50,700	53,200	43,100	50,800	53,300	42,900	50,400	52,600	43,700
Biological scientists	50,200	52,000	42,500	50,200	52,100	42,400	50,000	52,200	42,600
Agricultural scientists	48,700	49,800	40,400	49,000	50,100	40,400	45,500	47,000	42,000
Medical scientists	55,300	60,800	45,000	55,400	61,300	44,900	56,100	60,300	46,200
Psychologists	50,100	51,300	44,300	50,200	51,500	44,400	44,200	48,600	42,200
Social scientists	50,400	52,000	44,200	50,600	52,600	44,300	48,200	50,200	42,500
Economists	58,100	59,500	47,500	58,600	59,800	47,700	52,400	52,800	45,500
Sociologists/Anthropol	45,800	47,600	41,400	46,200	48,100	41,200	41,700	**	40,300
Other social scientists	48,600	50,400	42,500	48,800	50,600	42,500	47,500	49,400	36,800
ENGINEERS	62,500	62,900	53,400	64,300	65,000	53,200	58,400	58,600	54,000
Aeronautical/Astron	60,800	61,000	55,000	63,600	65,100	55,500	56,100	56,200	**
Chemical	62,700	63,700	51,700	62,600	63,300	51,500	64,200	64,300	**
Civil	58,300	58,600	50,300	60,400	60,700	50,700	51,900	51,900	**
Electrical/Electronic	67,100	67,400	58,500	70,500	70,600	59,300	61,100	61,200	58,000
Materials science	61,700	62,100	52,600	63,900	64,900	51,300	56,800	56,800	**
Mechanical	60,700	60,700	57,000	62,300	62,400	57,000	51,300	51,300	**
Nuclear	65,800	65,900	**	65,900	65,900	**	70,100	**	**
Systems design	68,500	70,000	53,500	70,300	72,100	53,500	64,600	64,600	**
Other	61,500	62,100	51,400	62,200	62,500	52,000	60,200	60,300	46,700
Years of prof. experience									
Less than 5	40,700	42,500	36,900	40,500	42,400	36,700	43,600	44,400	39,300
5-9	47,500	48,900	42,700	46,700	48,400	42,500	51,200	52,400	44,800
10-14	52,900	54,800	48,000	52,600	54,100	48,000	56,300	58,000	48,100
15-19	59,900	60,400	51,600	59,800	60,400	51,700	60,100	60,400	50,900
20-24	63,100	63,700	55,200	63,100	63,700	55,200	64,500	64,800	54,200
25-29	67,000	67,400	58,300	67,200	67,600	58,100	65,400	65,500	60,500
30-34	70,000	70,100	63,400	69,300	69,800	63,200	75,100	75,100	**
35 or more	74,100	74,500	62,300	74,300	74,700	63,200	**	**	**
No response	52,500	54,200	44,800	53,000	54,100	45,300	50,900	55,200	41,000
Sector of employment									
Business/Industry, total	61,500	63,100	52,400	62,700	64,900	52,500	58,800	59,500	52,000
Not self-employed	60,900	62,400	50,900	62,200	63,500	50,700	58,800	59,500	52,200
Self-employed	70,400	73,600	60,200	70,600	75,200	60,300	60,000	60,100	45,500
Educational institution	50,900	52,700	42,400	51,000	52,900	42,400	51,100	52,300	41,900
Univ./4-yr college	51,200	53,100	42,200	51,300	53,400	42,300	51,300	52,500	42,000
Other	46,200	46,700	44,600	46,300	46,800	44,800	45,700	45,900	40,300
Federal govt. (civilian)	53,900	55,100	45,900	54,400	55,300	45,800	50,400	50,800	47,000
State/Local govt	42,800	42,800	42,800	42,900	43,500	42,300	40,500	40,100	46,200
Hospitals/Clinics	45,100	48,000	39,900	45,000	48,000	39,800	47,900	48,700	39,400
Other non-profits	52,200	56,200	40,300	52,300	56,300	40,200	54,100	56,300	45,100
Other/No response	65,800	75,500	59,300	65,900	78,000	59,200	**	**	**
Primary work activity									
Research and development	54,500	55,600	45,300	54,700	55,700	45,300	54,200	55,100	46,600
Basic research	51,900	54,200	42,500	52,200	54,700	42,600	49,200	52,100	41,100
Applied research	54,600	55,500	47,000	54,700	55,600	46,800	54,300	55,200	48,500
Development	59,300	60,000	50,500	60,300	60,600	49,700	56,000	56,000	55,200
Management/Administration	66,800	70,100	50,700	66,800	70,000	50,700	70,600	75,000	52,900
of R&D	72,800	74,300	57,900	72,900	74,200	58,000	72,400	75,000	58,200
of Other	60,500	64,300	48,300	60,600	64,200	48,300	64,700	73,800	50,700
Teaching	48,400	50,200	41,200	48,300	50,200	41,100	51,200	51,800	42,500
Professional services	50,800	54,000	45,600	50,800	53,600	45,700	65,000	66,200	42,500
Rprt/Stat/Comput activ	50,600	51,600	42,100	50,900	52,100	40,700	46,600	47,900	45,800
Consulting	60,800	62,600	46,500	60,900	64,200	46,400	55,000	55,500	**
Other/No response	56,200	58,500	42,800	56,200	58,700	42,700	57,000	57,600	45,600

[Continued]

Table 36. Median annual salaries of employed doctoral scientists and engineers, by employment-related characteristics, race/ethnicity, and sex: 1989

Characteristics	Black			Native American			Hispanic 3/		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Total	$48,500	$51,200	$44,400	$50,100	$51,500	$43,500	$50,000	$50,900	$42,700
Field 2/									
SCIENTISTS	47,200	50,500	44,300	48,700	51,000	40,900	48,300	50,300	42,400
Physical scientists	50,100	50,300	45,200	51,300	51,300	**	54,300	55,900	43,000
Chemists	45,600	45,600	45,500	**	**	**	53,700	55,500	42,200
Physicists/Astronomers	57,200	57,300	**	**	**	**	56,000	57,500	**
Mathematical scientists	44,500	44,500	**	**	**	**	44,000	44,300	**
Mathematicians	50,100	50,600	**	**	**	**	42,700	42,900	**
Statisticians	**	**	**	**	**	**	**	**	**
Computer/Information spec	**	**	**	**	**	**	56,900	56,900	**
Envlronmental scientists	63,400	63,400	**	**	**	**	49,300	49,300	**
Earth scientists	63,400	**	**	**	**	**	49,500	49,500	**
Oceanographers	**	**	**	**	**	**	**	**	**
Atmospheric scientists	**	**	**	**	**	**	**	**	**
Life scientists	46,300	47,100	44,500	51,100	**	37,200	50,100	50,600	39,700
Biological scientists	46,700	50,600	43,600	**	**	**	50,200	50,500	38,000
Agricultural scientists	40,200	40,100	**	**	**	**	37,700	37,400	**
Medical scientists	46,900	55,700	45,700	67,100	**	**	59,500	75,500	40,500
Psychologists	44,400	46,900	42,900	48,500	**	**	45,700	49,700	43,700
Social scientists	47,200	47,900	45,000	48,000	**	**	44,300	44,800	43,300
Economists	50,200	**	**	**	**	**	60,900	72,100	**
Sociologists/Anthropol	45,300	49,000	44,000	**	**	**	35,500	**	40,200
Other social scientists	47,200	47,700	45,100	**	**	**	41,700	40,900	42,700
ENGINEERS	55,700	55,500	**	**	**	**	55,400	55,600	50,100
Aeronautical/Astron	**	**	**	**	**	**	**	**	**
Chemical	**	**	**	**	**	**	55,400	**	**
Civil	**	**	**	**	**	**	**	**	**
Electrical/Electronic	59,500	**	**	**	**	**	51,300	51,500	**
Materials science	**	**	**	**	**	**	**	**	**
Mechanical	**	**	**	**	**	**	**	**	**
Nuclear	**	**	**	**	**	**	**	**	**
Systems design	**	**	**	**	**	**	**	**	**
Other	**	**	**	**	**	**	58,800	58,800	**
Years of prof. experience									
Less than 5	37,100	36,700	38,100	38,100	38,800	36,900	37,100	37,100	37,200
5-9	48,300	51,000	44,900	48,300	48,800	**	45,700	46,200	43,000
10-14	51,100	52,700	46,400	**	**	**	54,900	56,300	50,700
15-19	57,300	58,400	54,500	**	**	**	61,000	61,600	51,800
20-24	60,600	**	**	**	**	**	68,900	69,200	**
25-29	**	**	**	**	**	**	**	**	**
30-34	**	**	**	**	**	**	**	**	**
35 or more	**	**	**	**	**	**	**	**	**
No response	**	**	**	**	**	**	43,100	**	**
Sector of employment									
Business/Industry, total	58,900	60,100	55,100	65,600	67,100	**	60,900	63,500	50,400
Not self-employed	57,200	58,500	54,200	65,200	65,600	**	61,000	63,200	49,600
Self-employed	62,000	65,200	56,100	**	**	**	60,600	70,100	52,000
Educational institution	45,400	47,100	42,200	48,300	48,600	38,200	44,900	47,000	39,400
Univ./4-yr college	45,700	47,400	42,000	48,400	48,700	38,400	44,900	47,000	39,400
Other	42,200	**	42,700	**	**	**	45,100	45,400	**
Federal govt. (civilian)	53,300	53,600	50,800	**	**	**	50,800	50,900	**
State/Local govt	44,800	**	45,100	**	**	**	39,700	**	**
Hospitals/Clinics	42,800	**	44,400	**	**	**	44,700	48,400	40,800
Other non-profits	43,600	**	43,500	**	**	**	46,800	**	**
Other/No response	**	**	**	**	**	**	**	**	**
Primary work activity									
Research and development	48,900	50,500	44,300	55,300	60,300	**	50,100	50,400	45,600
Basic research	50,200	51,900	42,000	51,600	**	**	50,300	50,600	42,800
Applied research	48,000	48,500	44,800	60,500	**	**	49,500	50,100	47,100
Development	**	**	**	**	**	**	54,100	55,100	**
Management/Administration	58,500	62,000	47,700	54,600	**	**	60,600	63,600	48,400
of R&D	69,400	75,400	**	**	**	**	70,200	70,500	52,800
of Other	54,000	60,200	46,900	**	**	**	52,200	52,900	47,000
Teaching	42,900	45,300	41,200	48,100	**	**	43,500	44,900	36,600
Professional services	45,000	48,500	43,500	**	**	**	45,900	50,100	40,400
Rprt/Stat/Comput activ	51,300	**	**	**	**	**	65,100	**	**
Consulting	63,200	**	**	**	**	**	80,200	80,300	**
Other/No response	55,800	60,100	50,000	**	**	**	47,700	47,800	41,800

** Median salaries were not computed for groups with fewer than 20 individuals reporting salary.

1/ Totals include individuals whose race was specified as "other" and individuals from whom no response was received.

2/ All doctoral scientists and engineers employed in a science or engineering (S&E) field were categorized by their field of employment when that information was available. When it was not, or when employment field was other than science or engineering, the doctorate holders were categorized by their field of doctoral degree.

3/ Individuals who are included in the ethnic category "Hispanic" also may have been included in one of the race categories.

NOTES: All numbers in the table are estimates derived from a sample.

Median salaries were computed only for full-time employed civilians.

SOURCE: National Science Foundation/SRS, 1989 Survey of Doctorate Recipients

Table 37. Median annual salaries of employed doctoral scientists and engineers, by employment-related characteristics and citizenship status: 1989

Characteristics	Citizenship						
		U.S.			Non-U.S.		
	Total 1/	Total	Native	Natlzd	Total	Perm res	Temp res
Total	$54,600	$55,000	$53,900	$60,100	$50,900	$52,600	$40,700
Field 2/							
SCIENTISTS	52,200	52,300	51,900	57,400	49,600	50,900	38,200
Physical scientists	56,000	56,500	55,900	60,400	50,100	53,400	34,900
Chemists	55,000	55,400	55,100	59,200	46,900	50,800	**
Physicists/Astronomers	58,600	58,900	58,100	61,700	52,800	56,800	36,200
Mathematical scientists	51,600	52,200	51,600	59,100	42,000	47,400	38,500
Mathematicians	51,600	52,200	51,400	61,100	41,700	42,600	**
Statisticians	51,500	53,000	52,600	53,600	47,300	50,100	**
Computer/Information spec	58,500	58,600	58,300	60,600	56,600	60,100	**
Environmental scientists	55,100	55,100	53,900	63,200	52,800	58,900	**
Earth scientists	55,700	55,600	55,100	62,800	63,000	63,300	**
Oceanographers	50,600	50,600	50,200	**	**	**	**
Atmospheric scientists	53,300	56,500	53,600	71,500	41,300	**	**
Life scientists	50,700	50,800	50,500	56,400	46,100	47,900	34,400
Biological scientists	50,200	50,300	50,000	54,200	45,600	46,800	**
Agricultural scientists	48,700	48,800	48,800	50,000	45,200	47,500	**
Medical scientists	55,300	55,500	54,400	67,300	50,200	50,800	**
Psychologists	50,100	50,100	50,000	51,000	46,200	48,900	**
Social scientists	50,400	50,500	50,400	51,600	48,700	48,900	44,400
Economists	58,100	58,000	58,100	55,800	60,400	52,900	**
Sociologists/Anthropol	45,800	46,000	45,800	51,500	38,300	39,000	**
Other social scientists	48,600	48,800	48,600	50,800	46,300	47,600	**
ENGINEERS	62,500	64,300	64,800	63,200	53,400	55,200	46,100
Aeronautical/Astron	60,800	62,200	65,300	56,600	51,500	**	**
Chemical	62,700	64,600	64,000	65,000	55,100	55,200	**
Civil	58,300	60,300	61,100	55,700	48,700	51,000	**
Electrical/Electronic	67,100	70,400	70,900	67,100	55,600	58,200	48,800
Materials science	61,700	63,500	62,600	63,900	48,900	56,000	**
Mechanical	60,700	61,300	62,400	55,400	48,000	48,200	**
Nuclear	65,800	66,900	66,600	70,200	**	**	**
Systems design	68,500	72,200	68,600	75,600	55,200	**	**
Other	61,500	62,500	62,200	65,500	52,900	55,100	**
Years of prof. experience							
Less than 5	40,700	40,500	40,400	44,300	43,100	45,300	38,900
5-9	47,500	46,900	46,200	51,400	51,600	51,900	**
10-14	52,900	52,800	52,500	56,100	60,000	60,200	**
15-19	59,900	59,900	59,100	60,900	59,600	59,300	**
20-24	63,100	63,000	62,900	63,300	64,900	64,800	**
25-29	67,000	67,000	66,500	70,600	65,300	65,300	**
30-34	70,000	69,600	68,700	73,300	72,200	72,000	**
35 or more	74,100	74,300	72,600	81,900	**	**	**
No response	52,500	53,200	50,900	57,700	48,200	45,800	**
Sector of employment							
Business/Industry, total	61,500	62,300	62,300	63,100	55,400	56,700	44,500
Not self-employed	60,900	61,800	61,500	62,900	55,200	56,500	44,300
Self-employed	70,400	70,400	70,500	70,200	70,100	70,700	**
Educational institution	50,900	51,100	50,500	57,600	48,600	50,300	36,800
Univ./4-yr college	51,200	51,400	50,700	58,300	48,800	50,500	36,800
Other	46,200	46,300	46,400	45,500	**	**	**
Federal govt. (civilian)	53,900	53,900	54,100	52,800	**	**	**
State/Local govt	42,800	42,900	42,900	45,000	37,300	39,000	**
Hospitals/Clinics	45,100	45,100	44,400	54,000	**	**	**
Other non-profits	52,200	52,600	52,100	60,100	45,300	51,900	**
Other/No response	65,800	66,500	67,200	**	60,900	**	**
Primary work activity							
Research and development	54,500	55,000	54,100	59,700	50,300	51,900	40,600
Basic research	51,900	52,300	51,500	60,100	48,300	50,800	36,300
Applied research	54,600	55,000	54,200	60,000	50,200	51,400	44,100
Development	59,300	60,100	60,300	57,900	53,500	53,800	**
Management/Adiminstration	66,800	66,800	65,900	75,000	70,200	70,200	**
of R&D	72,800	72,900	72,500	75,500	70,300	70,300	**
of Other	60,500	60,500	60,100	72,000	68,500	68,300	**
Teaching	48,400	48,400	47,900	55,200	48,500	50,200	38,100
Professional services	50,800	50,800	50,600	60,600	52,700	53,500	**
Rprt/Stat/Comput activ	50,600	50,600	50,300	51,300	51,100	51,300	**
Consulting	60,800	60,900	60,700	70,000	57,500	63,200	**
Other/No response	56,200	55,900	55,700	57,200	62,800	66,100	**

** Median salaries were not computed for groups with fewer than 20 individuals reporting salary.

1/ Total(s) include(s) individuals for whom citizenship was unspecified and from whom no response was received.

2/ All doctoral scientists and engineers employed in a science or engineering (S&E) field were categorized by their field of employment when that information was available. When it was not, or when employment field was other than science or engineering, the doctorate holders were categorized by their field of doctoral degree.

NOTES: All numbers in the table are estimates derived from a sample.

Median salaries were computed only for full-time employed civilians.

SOURCE: National Science Foundation/SRS, 1989 Survey of Doctorate Recipients

Table 38. Median annual salaries of employed doctoral scientists and engineers, by employment-related characteristics and employment sector: 1989

Characteristics	Total 1/ employed	Education		Business/Industry			Government		Non-profit 2/
		Total	Univ./ 4-yr coll	Total	Not self-emp	Self-emp	Federal civilian	State/ Local	
Total	$54,600	$50,900	$51,200	$61,500	$60,900	$70,400	$53,900	$42,800	$48,000
Field 3/									
SCIENTISTS	52,200	49,500	50,000	60,700	60,400	70,300	53,200	42,600	45,800
Physical scientists	56,000	52,100	52,600	60,300	60,200	75,800	54,400	38,000	55,400
Chemists	55,000	48,200	48,600	60,000	60,000	75,100	51,000	37,500	52,600
Physicists/Astronomers	58,600	55,800	56,400	60,900	60,800	**	59,000	**	55,900
Mathematical scientists	51,600	50,800	51,200	60,100	59,100	**	53,300	**	55,500
Mathematicians	51,600	50,400	51,100	60,700	60,400	**	54,600	**	**
Statisticians	51,500	51,400	51,400	54,500	54,500	**	47,000	**	**
Computer/Information spec	58,500	55,100	55,300	60,900	60,900	60,900	54,600	43,500	60,000
Environmental scientists	55,100	50,600	50,700	63,300	63,600	60,100	55,900	40,700	50,800
Earth scientists	55,700	50,500	50,600	63,700	63,900	60,000	55,900	40,500	55,800
Oceanographers	50,600	52,000	52,000	51,500	51,900	**	52,800	**	42,600
Atmospheric scientists	53,300	48,000	48,000	59,500	57,400	**	59,600	**	**
Life scientists	50,700	48,800	49,000	58,800	58,000	70,600	50,600	40,900	49,100
Biological scientists	50,200	48,200	48,500	56,500	56,700	50,500	50,300	39,500	46,500
Agricultural scientists	48,700	46,900	46,600	50,500	50,700	42,200	50,000	38,200	45,700
Medical scientists	55,300	51,500	51,500	70,000	65,900	85,700	53,200	47,000	52,200
Psychologists	50,100	47,100	46,800	67,800	60,300	70,600	50,100	42,800	42,100
Social scientists	50,400	48,700	48,800	65,100	66,900	50,600	57,900	45,100	47,500
Economists	58,100	54,400	54,700	70,900	75,000	**	61,000	**	56,700
Sociologists/Anthropol	45,800	45,900	46,200	50,200	50,200	**	**	**	38,000
Other social scientists	48,600	47,900	47,900	55,700	63,000	50,700	53,800	45,000	45,700
ENGINEERS	62,500	61,500	61,600	64,800	64,400	76,300	58,700	49,800	69,100
Aeronautical/Astron	60,800	63,500	63,500	60,500	60,500	**	55,100	**	**
Chemical	62,700	58,300	58,300	64,200	64,200	**	**	**	**
Civil	58,300	59,400	59,500	60,200	56,200	**	56,700	49,000	**
Electrical/Electronic	67,100	64,400	64,400	70,500	70,200	**	62,200	**	**
Materials science	61,700	63,800	63,800	60,800	60,700	**	62,100	**	**
Mechanical	60,700	60,000	60,000	60,800	60,800	**	50,000	**	**
Nuclear	65,800	68,000	68,100	65,500	65,900	**	**	**	**
Systems design	68,500	67,800	67,800	67,500	67,600	**	**	**	**
Other	61,500	59,300	59,600	64,700	64,400	112,200	57,700	**	55,200
Years of prof. experience									
Less than 5	40,700	36,700	36,600	48,100	47,800	50,600	39,800	34,900	37,800
5-9	47,500	42,000	41,900	55,600	54,800	70,800	45,400	41,700	43,300
10-14	52,900	48,300	48,500	62,800	62,300	70,800	50,900	44,300	49,500
15-19	59,900	54,200	54,600	70,200	70,100	70,200	60,000	45,600	60,500
20-24	63,100	61,000	61,300	75,200	75,100	75,500	60,900	47,700	62,400
25-29	67,000	63,800	64,000	75,600	75,700	75,300	69,900	55,900	67,200
30-34	70,000	66,600	66,700	78,100	78,800	65,900	71,100	**	70,300
35 or more	74,100	75,300	75,400	79,000	75,800	90,600	71,400	**	72,000
No response	52,500	49,900	50,100	58,800	60,000	55,700	50,100	**	50,500
Primary work activity									
Research and development	54,500	52,400	52,400	57,300	57,100	75,100	50,900	38,700	50,800
Basic research	51,900	52,100	52,100	56,500	56,600	**	50,500	46,200	45,800
Applied research	54,600	52,700	52,800	56,500	56,300	89,400	50,700	38,100	54,100
Development	59,300	57,800	57,800	59,400	59,500	40,600	58,500	**	68,000
Management/Administration	66,800	62,800	63,800	77,300	78,000	45,700	62,800	50,000	58,100
of R&D	72,800	66,900	67,100	77,900	78,100	50,500	63,900	51,000	70,900
of Other	60,600	61,600	63,100	73,200	77,200	45,200	60,000	48,900	50,800
Teaching	48,400	48,400	48,600	56,200	55,200	**	48,400	**	45,400
Professional services	50,800	48,400	47,000	70,400	55,100	70,900	46,200	41,000	42,000
Rprt/Stat/Comput activ	50,600	45,300	45,200	55,400	55,600	50,700	46,200	40,400	41,600
Consulting	60,800	45,700	45,800	63,500	62,200	72,000	53,600	40,000	60,600
Other/No response	56,200	47,300	47,700	62,100	62,900	54,800	50,100	40,100	40,800

** Median salaries were not computed for groups with fewer than 20 individuals reporting salary.

1/ Totals include individuals who work in employment sectors other than education, business/industry, government, and nonprofit organizations; they also include individuals from whom no response was received.
2/ "Nonprofit" [organizations] include hospitals and clinics.
3/ All doctoral scientists and engineers employed in a science or engineering (S&E) field were categorized by their field of employment when that information was available. When it was not, or when employment field was other than science or engineering, the doctorate holders were categorized by their field of doctoral degree.

NOTES: All numbers in the table are estimates derived from a sample.

Median salaries were computed for full-time employed civilians.

SOURCE: National Science Foundation/SRS, 1989 Survey of Doctorate Recipients

Table 39. Median annual salaries of employed doctoral scientists and engineers, by employment-related characteristics and primary work activity: 1989

Characteristics	Total employed	Research & Development				Management/Admin			Teaching	Prof. Serv.	Consulting	Other/ No resp
		Total	Basic	App'd	Devlop/ Design	Total	of R&D	of Other				
Total	$54,600	$54,500	$51,900	$54,600	$59,300	$66,800	$72,800	$60,500	$48,400	$50,800	$60,800	$53,400
Field 1/												
SCIENTISTS	52,200	52,500	51,100	52,800	55,600	64,200	70,500	58,900	47,200	50,700	60,500	51,300
Physical scientists	56,000	55,200	54,300	55,600	54,000	74,400	75,300	70,100	48,200	59,800	72,300	56,000
Chemists	55,000	53,600	51,400	54,500	53,400	72,800	75,200	66,300	45,900	**	72,400	54,500
Physicists/Astronomers	58,600	57,700	56,900	58,500	55,900	75,100	75,600	74,400	51,000	**	**	59,100
Mathematical scientists	51,600	59,500	59,000	59,600	**	60,900	63,500	60,800	48,500	**	55,300	51,800
Mathematicians	51,600	60,000	60,100	59,200	**	61,800	65,800	61,200	48,100	**	58,600	52,800
Statisticians	51,500	52,000	51,300	**	**	**	**	**	50,800	**	**	51,300
Computer/Information spec	58,500	60,300	62,700	63,000	58,200	70,700	77,200	61,200	53,100	**	65,600	52,300
Environmental scientists	55,100	53,700	52,100	54,100	58,500	63,500	65,200	60,600	48,200	**	62,700	51,600
Earth scientists	55,700	55,400	55,000	55,500	**	65,000	66,400	60,400	48,100	**	62,900	55,600
Oceanographers	50,600	50,300	51,600	48,200	**	60,100	58,400	**	48,600	**	**	**
Atmospheric scientists	53,300	50,600	48,800	48,900	**	70,000	70,400	**	47,900	**	**	**
Life scientists	50,700	50,000	49,000	50,000	55,500	63,200	67,100	57,700	45,900	59,800	50,300	47,100
Biological scientists	50,200	50,100	48,700	50,900	55,100	62,500	68,400	55,300	45,200	52,500	50,200	47,400
Agricultural scientists	48,700	45,500	48,300	45,200	50,100	62,300	63,100	59,700	48,200	**	45,500	43,100
Medical scientists	55,300	54,000	51,500	54,300	70,800	64,700	72,200	58,700	48,000	60,500	65,200	50,400
Psychologists	50,100	48,900	50,000	48,500	**	54,700	65,000	52,900	46,000	50,500	52,900	51,700
Social scientists	50,400	51,600	51,300	51,700	**	59,400	62,100	58,800	47,000	45,800	70,500	50,700
Economists	58,100	55,000	53,900	55,200	**	72,000	75,500	70,500	52,800	**	70,900	60,900
Sociologists/Anthropol	45,800	50,000	51,800	46,000	**	54,200	**	54,200	44,300	**	**	39,300
Other social scientists	48,600	48,900	47,900	51,000	**	55,500	57,400	55,400	45,700	42,200	55,800	50,000
ENGINEERS	62,500	60,000	56,600	59,100	60,500	75,800	75,800	75,800	59,400	**	62,700	65,400
Aeronautical/Astron	60,800	56,900	56,100	54,600	60,500	78,000	75,500	**	63,100	**	**	70,500
Chemical	62,700	60,100	55,400	60,800	58,800	76,700	76,500	**	60,100	**	**	62,100
Civil	58,300	55,300	**	57,800	**	73,700	**	76,100	55,900	**	56,500	60,500
Electrical/Electronic	67,100	61,900	70,600	60,600	62,900	80,000	80,000	80,000	61,700	**	**	74,000
Materials science	61,700	56,700	54,700	60,000	55,900	75,200	75,000	**	61,400	**	**	65,200
Mechanical	60,700	58,700	55,600	55,200	60,800	76,900	77,400	**	58,700	**	**	**
Nuclear	65,800	62,800	**	62,800	**	**	**	**	**	**	**	**
Systems design	68,500	64,000	**	65,300	61,600	79,700	78,800	**	67,400	**	**	65,200
Other	61,500	59,300	60,100	55,700	60,800	73,300	75,300	66,600	56,900	**	60,600	57,800
Years of prof. experience												
Less than 5	40,700	43,700	38,600	45,200	48,900	45,100	52,500	40,000	35,800	36,300	45,400	40,200
5-9	47,500	48,300	42,700	50,300	53,700	55,600	61,100	50,400	40,200	50,800	55,600	48,400
10-14	52,900	55,000	51,400	55,100	60,100	62,400	66,500	54,600	45,100	53,800	64,500	52,200
15-19	59,900	61,000	60,000	60,700	66,400	68,300	75,000	60,700	50,000	60,100	70,300	60,900
20-24	63,100	63,900	64,900	63,100	66,100	75,300	80,100	70,700	55,300	60,500	65,700	65,300
25-29	67,000	70,000	72,800	66,500	62,100	76,100	81,800	73,500	58,800	65,500	60,700	65,900
30-34	70,000	71,600	73,100	70,500	70,400	78,700	80,700	77,600	62,400	60,800	78,000	65,500
35 or more	74,100	75,000	80,800	70,900	66,200	80,700	80,400	82,100	69,400	68,100	90,300	65,000
No response	52,500	55,100	50,600	60,000	53,800	60,700	70,600	56,300	50,100	34,200	**	50,300
Sector of employment												
Business/Industry, total	61,500	57,300	56,500	56,500	59,400	77,300	77,900	73,100	56,200	70,400	63,500	60,200
Not self-employed	60,900	57,100	56,600	56,300	59,500	78,000	78,100	77,200	55,200	55,100	62,200	60,400
Self-employed	70,400	75,100	**	89,400	40,600	45,700	50,500	45,300	**	70,900	72,000	54,100
Educational institution	50,900	52,400	52,100	52,700	57,800	62,800	66,900	61,400	48,400	48,400	45,700	46,600
Univ./4-yr college	51,200	52,400	52,100	52,800	57,800	63,800	67,100	63,000	48,600	47,000	45,800	47,000
Other	46,200	**	**	**	**	51,500	**	51,100	42,700	50,200	**	42,600
Federal govt. (civilian)	53,900	50,900	50,500	50,700	58,500	62,800	63,900	59,400	48,400	46,200	53,600	47,500
State/Local govt	42,800	38,700	46,200	38,100	**	50,000	51,000	48,900	**	41,000	40,000	40,200
Hospitals/Clinics	45,100	46,200	42,300	48,800	**	48,900	**	48,600	**	43,500	**	40,600
Other non-profits	52,200	53,700	46,600	54,900	68,300	65,200	72,300	54,300	**	33,100	60,800	41,600
Other/No response	65,800	59,600	**	**	**	**	**	**	**	**	**	82,400

** Median salaries were not computed for groups with fewer than 20 individuals reporting salary.

1/ All doctoral scientists and engineers employed in a science or engineering (S&E) field were categorized by their field of employment when that information was available. When it was not, or when employment field was other than science or engineering, the doctorate holders were categorized by their field of doctoral degree.

NOTES: All numbers in the table are estimates derived from a sample.

Median salaries were computed only for full-time employed civilians.

SOURCE: National Science Foundation/SRS, 1989 Survey of Doctorate Recipients

Table 40. Median annual salaries of employed doctoral scientists and engineers, by employment-related characteristics and broad field: 1989

Characteristics	Total	All sci.	Physical sci.	Math. sci.	Computer inf.spec.	Environ. sci.	Life sci.	Psycho-logists	Social sci.	All engineers
Total	$54,600	$52,200	$56,000	$51,600	$58,500	$55,100	$50,700	$50,100	$50,400	$62,500
Years of prof. experience										
Less than 5	40,700	38,500	43,500	36,700	53,500	37,200	36,700	36,400	36,900	49,000
5-9	47,500	45,500	48,900	42,500	53,400	46,500	43,100	45,800	43,500	55,600
10-14	52,900	51,000	55,700	50,400	57,700	55,100	50,300	50,300	49,700	62,500
15-19	59,900	56,700	60,300	53,500	63,300	61,400	55,400	52,300	55,700	68,600
20-24	63,100	61,000	62,200	60,200	61,100	63,000	60,700	58,100	61,800	72,900
25-29	67,000	64,500	66,200	61,700	76,300	70,600	63,300	59,700	63,800	75,000
30-34	70,000	67,900	68,400	73,000	74,700	74,500	66,200	67,000	67,300	75,500
35 or more	74,100	72,500	69,800	76,400	**	87,300	73,800	67,900	75,600	80,900
No response	52,500	50,600	55,200	55,000	51,900	**	53,900	45,500	48,700	55,800
Sector of employment										
Business/Industry, total	61,500	60,700	60,300	60,100	60,900	63,300	58,800	67,800	65,100	64,800
Not self-employed	60,900	60,400	60,200	59,100	60,900	63,600	58,000	60,300	66,900	64,400
Self-employed	70,400	70,300	75,800	**	60,900	60,100	70,600	70,600	50,600	76,300
Educational institution	50,900	49,500	52,100	50,800	55,100	50,600	48,800	47,100	48,700	61,500
Univ./4-yr college	51,200	50,000	52,600	51,200	55,300	50,700	49,000	46,800	48,800	61,600
Other	46,200	46,200	44,900	44,300	**	**	44,200	49,000	44,500	**
Federal govt. (civilian)	53,900	53,200	54,400	53,300	54,600	55,900	50,600	50,100	57,900	58,700
State/Local govt	42,800	42,600	38,000	**	43,500	40,700	40,900	42,800	45,100	49,800
Hospitals/Clinics	45,100	45,100	60,300	**	**	**	48,400	42,600	**	**
Other non-profits	52,200	48,900	52,900	55,500	60,200	50,800	50,600	37,800	47,700	69,100
Other/No response	65,800	70,100	**	**	**	**	**	**	82,300	**
Primary work activity										
Research and development	54,500	52,500	55,200	59,500	60,300	53,700	50,000	48,900	51,600	60,000
Basic research	51,900	51,100	54,300	59,000	62,700	52,100	49,000	50,000	51,300	56,600
Applied research	54,600	52,800	55,600	59,600	63,000	54,100	50,000	48,500	51,700	59,100
Development	59,300	55,600	54,000	**	58,200	58,500	55,500	**	**	60,500
Management/Administration	66,800	64,200	74,400	60,900	70,700	63,500	63,200	54,700	59,400	75,800
of R&D	72,800	70,500	75,300	63,500	77,200	65,200	67,100	65,000	62,100	75,800
of Other	60,500	58,900	70,100	60,800	61,200	60,600	57,700	52,900	58,800	75,800
Teaching	48,400	47,200	48,200	48,500	53,100	48,200	45,900	46,000	47,000	59,400
Professional services	50,800	50,700	59,800	**	**	**	59,800	50,500	45,800	**
Rprt/Stat/Comput activ	50,600	50,200	50,700	51,500	51,600	50,500	45,300	48,600	50,000	54,400
Consulting	60,800	60,500	72,300	55,300	65,600	62,700	50,300	52,900	70,500	62,700
Other/No response	56,200	53,000	56,300	56,000	60,300	57,000	48,300	54,600	52,900	67,400

** Median salaries were not computed for groups with fewer than 20 individuals reporting salary.

NOTES: All numbers in the table are estimates derived from a sample.

Median salaries were computed only for full-time employed civilians.

All doctoral scientists and engineers employed in a science or engineering (S&E) field were categorized by their field of employment when that information was available. When it was not or when the employment field was other than science or engineering, doctorate holders were categorized by their field of degree.

SOURCE: National Science Foundation/SRS, 1989 Survey of Doctorate Recipients

Appendixes

A. Technical Notes
B. Survey Questionnaire

Appendix A. Technical Notes

The data in this report come from the Longitudinal Doctorate Project, a longitudinal data file of information on the supply and utilization of science and engineering doctoral personnel living in the United States.[2] Current information on the characteristics of this population is based on the 1989 Survey of Doctorate Recipients (SDR). The SDR has been conducted biennially since 1973 by the National Research Council for the National Science Foundation. Data from the SDR and other data sources are combined to create a longitudinal file on the demographic and employment characteristics of doctoral scientists and engineers.

Survey Universe

The SDR survey universe is the total population of doctoral-level scientists and engineers living in the United States. A roster of such individuals was compiled for the 1973 SDR from: the Doctorate Records File (DRF), a file of data on all doctorate recipients from U.S. institutions maintained by the National Research Council (NRC); NSF's National Register of Scientific and Technical Personnel, which from 1954 to 1970 collected information on highly qualified personnel in science and engineering fields; **American Men and Women in Science**; and several other sources including university and college catalogues of doctorate-granting institutions; Federal laboratories; and selected industrial organizations. While these sources provide an essentially complete roster of science and engineering doctorates awarded by U.S. institutions, persons who held foreign-earned doctorates were not covered if their degree was received after 1972. Those employed in S&E occupations with doctorates in nonS&E fields were only included if they received a degree prior to 1973 or if they were in the Humanities subset of the SDR survey.

The target population for the 1989 SDR was those who had earned doctorates in science or engineering during the 42-year period from January 1, 1946 to June 30, 1988. This population includes persons with degrees (or employment in the few cases where degree was unknown) in the natural or social sciences, mathematics, or engineering. Individuals not in the U.S. at the time of the SDR survey were excluded from the survey results. Citizens of foreign countries who indicated at the time they received their degree that they had firm plans to leave the United States after obtaining their doctorate were not surveyed.

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[2] Beginning in 1977, the National Endowment for the Humanities (NEH) sponsored an expansion of the Survey of Doctorate Recipients to include the Humanities. This report covers only that portion of the survey population in science and engineering.

Sample Design

The 1989 SDR sample of 72,555 was selected from a frame [1] of 525,685 at an overall sampling rate of about 14 percent. Individuals in the file of new and old doctorate degree holders were stratified by six demographic and educational variables. To increase the reliability of estimates for small groups, variable sampling rates were used, ranging from 2 percent for the largest cells to 100 percent for the smallest cells. The stratification variables were: (1) Source and type of degree; (2) sex; (3) field of doctorate; (4) year of doctorate; (5) racial/ethnic identification; and (6) citizenship at the time of degree award.

A discussion of how the stratification variables were used to increase the reliability of estimates follows below:

(1) Source and type of degree--Since the roster is compiled from several sources it was necessary to treat as separate segments those who received their degrees from U.S. institutions, those who held doctorates from foreign institutions, and those who held non-S&E doctorates but never known to be working in science and engineering.

(2) Sex--The number of women S&E doctorate-holders is significantly smaller than that of men. Sex, therefore, was used for stratification to ensure adequate representation of women in the sample.

(3) Field of doctorate--The major subject of a person's doctorate was used for stratification. For individuals who received U.S. doctorates, field of doctorate was that recorded in the Doctorate Records File. Field of employment was used when degree field was unavailable.

(4) Year of the doctorate--Individuals were grouped according to year of doctorate. Since the earlier classes had fewer graduates, a larger number of years was grouped. As the size of classes increased in later years, the number of classes included in a cohort was decreased.

(5) Racial/ethnic identification--This stratum was selected to ensure that minorities would be adequately sampled. Racial/ethnic data were available beginning with the 1973 graduating cohort.

(6) Citizenship--Analysis of survey results revealed a higher rate of nonresponse among foreign citizens than among U.S. citizens. Accordingly, citizenship was included to allow for better nonresponse adjustments for foreign citizens.

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[1] The sampling frame includes known to be deceased, those residing in foreign countries, and those with doctorates in education or professional fields who no longer worked in science and engineering. Thus, the total population estimates in this report are below the total in the sampling frame.

Collection

The 1989 SDR was a mail survey. The questionnaire was first mailed in March 1989. A follow up mailing to nonrespondents occurred in early May, and a second in September 1989.

Of the 72,555 individuals in the sample, 2,160 were deceased or otherwise out-of-scope of the survey, including those who indicated on a previous survey that they held a doctorate from a foreign institution and were foreign citizens living outside the United States. This resulted in an active sample of 70,395 scientists and engineers. Analysis of undeliverable questionnaires showed an estimated 61,982 individuals were contacted. A total of 38,799 survey responses was returned. The survey overall response rates were 55.1 percent for the active sample and 62.6 percent of those contacted. The overall response rate for the 1989 active sample reflects respective declines of 3.0 and 8.3 percentage points below 1987 and 1985 levels. Information on sample sizes and response rates for selected items are found in tables A-1 through A-11.

Estimation

The sampling rates varied by strata, requiring differential weights to generate total population estimates. Responses were assigned a weight that is the product of the sample weight for the stratum from which the sample case was drawn and the nonresponse adjustment factor.[4] No adjustments were made for item nonresponse.

Reliability [5]

The statistics in this report are subject to both sampling and nonsampling error. Sampling variability occurs because a sample rather than an entire population is surveyed. Sampling errors are developed using a generalized procedure. Approximations were required in order to derive sampling errors that would be applicable to a wide variety of items. As a result, these sampling errors provide an indication of the order of magnitude of a sampling error rather than a precise sampling error for any specific item. The sampling error tables are

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[4] The nonresponse adjustment factor is the number of survey sample cases in the stratum divided by the number of responses in the stratum. The sample weights (Ws) and the response weights (Wr) for each stratum were computed as follows:

Ws_h = (N_h/n_h) where N_h and n_h are the respective population and sample sizes of stratum (h).

Wr_h = $[(N_h/n_h)*(n_h/r_h)]$ where n_h is the number of survey sample cases in the stratum and r_h is the number of survey responses in that stratum.

[5] The data and material on sampling reliability presented here are from The Methodological Report of the 1989 Survey of Doctorate Recipients (Washington, D.C.: Office of Scientific and Engineering Personnel, National Research Council, 1991).

derived from standard error equations and special parameters developed by the Bureau of the Census.

Information is provided in table A-2 which permits the user to calculate approximate standard errors for totals using the formula:

$$s_x = [ax^2 + bx]^{1/2}$$

where "x" equals the estimated total and "a" and "b" are regression coefficients. Values of "a" and "b" by S&E fields for selected groups are given.[6]

Tables A-3 through A-6 present approximate standard errors associated with total subgroup size for different segments of the doctoral population. Tables A-7 through A-10 present standard error estimates for the estimated percent[7] of a subgroup having a particular characteristic.

Alternately, the approximate standard error of the percent may be estimated directly using the formula:

$$s_p = p[b((1/x)-(1/y))]^{1/2}$$

where p equals the percent possessing the specific characteristic and x and y represent the numerator and denominator, respectively, of the ratio which yields the observed percent.

The standard error estimates included in this report provide approximations of sampling reliability. They should not be considered precise measures.[8]

In addition to sampling error, data is subject to nonsampling error. Sources of nonsampling error include nonresponse bias, which arises when individuals who do not respond to a survey differ significantly from those who do and measurement error, which arises when we are not able to precisely measure the variables of interest. These sources of error are much harder to estimate than sampling errors.

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[6]The generalized error estimates in this report were based on a set of assumptions which in the case of some small subpopulations did not appear to hold. In such cases, the parameters listed for a higher-level field within a demographic group or a higher-level demographic group within a field was considered a useful substitute as a generalized error estimate.

[7]Based on the ratio of two estimated totals, where the numerator is a subset of the denominator.

[8]The standard error estimates were derived from generalized functions based on a limited set of characteristics and may overstate the error associated with estimates drawn from strata with high sampling fractions. See The Methodological Report of the 1989 Survey of Doctorate Recipients, op. cit.

In order to obtain information on possible nonresponse bias the NRC conducted a nonresponse bias study.[9] This study indicated that there are some statistically significant differences between respondents and nonrespondents. The major findings include:

- The size of the U.S. population and labor force of doctoral scientists and engineers may have been overestimated in 1989 by about 4 percent because a higher proportion of nonrespondents than respondents were located outside the United States.

- The unemployment rate of U.S. nonrespondents was the same as that of the respondents. This is evidence that published 1989 unemployment rates may not have been affected by nonresponse bias.

- Sector of employment was considerably affected by nonresponse bias: those employed in educational institutions may have been overestimated by about 5 percentage points, and those employed in business/industry may have been underestimated by about 3 percentage points.

- Tenure status also showed evidence of nonresponse bias: of those employed in 4-year colleges and universities, those not tenured may have been underestimated by about 4 percentage points.

Little direct information about measurement errors in the SDR exists. However, experience with minor question changes indicates that some variables may be subject to sizeable measurement problems. For example, in 1987 the question on primary work activity was reworded by providing definitions of basic and applied research.

Notes on the Tables

The following notes facilitate use of data in the detailed tables.

Field was derived primarily from responses to question 9 that requested the name and title of the specialty most closely related to the respondent's principal employment. The code was selected by respondents from the Employment Specialties List included with the questionnaire. Individuals who did not report S&E employment were assigned the specialty of their doctoral degree.

Sector of employment was based on responses to question 7. The category "educational institutions" includes junior colleges, 2-year colleges, technical institutes, medical schools

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[9]See Office of Scientific and Engineering Personnel, Nonresponse Bias in the 1989 Survey of Doctorate Recipients: An Exploratory Study (Washington, D.C.; National Academy of Sciences, 1991).

(including university-affiliated hospitals or medical centers), 4-year colleges or universities, and elementary, middle, or secondary school systems.

Geographic division was based primarily on responses to question 6 on the location of employment. Individuals not reporting place of employment were classified by their mailing address.

Place Of Birth categories were defined as follows:

U.S.	=	Fifty states plus the Virgin Islands, Panama Canal Zone, Puerto Rico, and Guam
Latin America	=	Mexico, Central America, Cuba & Islands
South America	=	Argentina, Bolivia, Brazil, Chile, Columbia, Ecuador, Guyana, Paraguay, Peru, Uruguay, Venuzuela
Northern Europe	=	Denmark, England, Finland, Iceland, Northern Ireland, Republic of Ireland, Norway, Scotland, Sweden, Wales
Central Europe	=	Austria, West Germany, Germany Unspecified, Italy, Liechtenstein, Malta
Western Europe	=	Belgium, France, Monaco, The Netherlands, Portugal, Spain, Switzerland
Eastern Europe	=	Bulgaria, Czechoslovakia, Greece, Hungary, Poland, Romania, U.S.S.R. Yugoslavia
Eastern Asia	=	Burma, People's Republic of China, Taiwan, China Unspecified, Hong Kong, Japan, Khmer Republic, Republic of Korea, Korea Unspecified, Laos, Macao, Malaysia, Singapore, Thailand, Democratic Republic of Vietnam, Republic of Vietnam
Western Asia	=	Afghanistan, Bahrain, Bangladesh, Cyprus, India, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Nepal, Pakistan pre-1971, Palestine, Saudi Arabia, Sri Lanka, Syria, Turkey

Australasia = Australia, Indonesia, New Zealand, Philippines.

Primary work activity was determined from responses to question 12. "Development" includes the development of equipment, products, and systems as well as the design of equipment, processes and models. The 1987 questionnaire was reworded to include definitions of basic and applied research.

Federal support was determined from responses to question 16. The reference period used for this question changed in 1987. The 1989 and 1987 questionnaires used "the past year" as the reference period, whereas prior surveys varied from the month of February, to a particular week in February, to the week defined by a particular day in February. Therefore, the data from survey years prior to 1987 are not comparable.

Tenure status was obtained from the response to question 11. The question was reworded in 1979 to gather information on tenure track in addition to the basic question on tenure. Due to the introduction of additional categories in 1979, the data from prior survey years are not comparable.

Salary data were derived from responses to question 14, which requested information regarding annual salary before deductions for income tax, social security, retirement, etc., but excluding bonuses, overtime, summer teaching, or other payment for professional work. Salaries reported are median annual salaries, rounded to the nearest $100 and computed for full-time employed civilian scientists and engineers only. Differences between calendar-year salaries (11 to 12 months) and academic-year salaries (9 to 10 months) for individuals employed in educational institutions have been accommodated by multiplying academic-year salaries by eleven-ninths to adjust to a calendar-year scale. For individuals not reporting whether their salary was for an academic or calendar-year, calendar year was used as the default category. Approximately, 10 percent of full-time employed scientists and engineers failed to make this distinction and approximately half of those had not reported any salary.

Racial/ethnic data were based on questions relating to race and Hispanic heritage. The race/ethnic data appearing in the time-series tables of this report may differ significantly from estimates published prior to 1983. At that time, an analysis of racial/ethnic information found that there were inaccuracies in these data, especially in the reported numbers of Hispanics and Native Americans. Accordingly, racial/ethnic data for all previous survey years were modified before being entered on the 1983 files. For subsequent doctorate recipients, racial/ethnic identity was taken from the annual Survey of Earned Doctorates (SED). The race/ethnic identity is not changed once an SED response has already been received. As a result of these modifications, race/ethnic data have become more accurate and stable over time.

Selected Employment Characteristics

This report contains several derived statistical measures reflecting labor force and employment rates as of February 1989:

Labor force participation rate. The labor force is defined as those employed (E) and those unemployed but seeking work (U). The labor force participation rate (R_{LF}) is the ratio of the labor force to the population (P).

$$R_{LF} = (E+U)/P$$

S&E employment rate. The S&E employment rate (R_{SE}) measures the ratio of those holding jobs in science or engineering (E_{SE}) to the total employment (E_T) of scientists and engineers, which includes those holding nonscience and nonengineering jobs.

$$R_{SE} = (E_{SE})/E_T$$

Unemployment rate. The unemployment rate (R_U) shows the ratio of those who are unemployed but seeking employment (U) to the total labor force (E+U).

$$R_U = U/(E+U)$$

S&E underemployment rate. The S&E underemployment rate (R_{UE}) shows the ratio of those who are working part time but seeking full-time jobs (E_{PTS}), or who are working in a non-S&E job when an S&E job would be preferred (E_{NSP}) to total employment (E_T).

$$R_{UE} = (E_{PTS}+E_{NSP})/E_T$$

S&E underutilization rate. The S&E underutilization rate (R_{UZ}) shows the proportion of those in the total labor force (E+U) who are either unemployed but seeking employment (U), working part time but seeking full-time jobs (E_{PTS}), or working involuntarily in a non-S&E job (E_{NSP}).

$$R_{UZ} = (U+E_{PTS}+E_{NSP})/(E+U)$$

Table A-1. Stratification, sample, and survey responses of doctoral scientists and engineers: 1989 Survey of Doctorate Recipients

	Sampling frame 1/	Active sample 2/	Sample contacted 3/	Survey responses	Response rates 4/ A	Response rates 4/ B
Total S&E sample	525,685	70,395	61,982	38,799	55.1%	62.6%
Segment/Citizenship						
U.S. S&E, U.S. citizen	385,293	50,357	45,352	29,979	59.5	66.1
U.S. S&E, foreign citizen	69,697	11,930	9,579	4,254	35.7	44.4
U.S. S&E, unkn citizen	51,778	6,029	5,550	3,686	61.1	66.4
U.S. Non-S&E, U.S. citizen	5,666	311	288	182	58.5	63.2
U.S. Non-S&E, foreign citizen	139	55	46	29	52.7	63.0
U.S. Non-S&E, unkn citizen	2,017	158	141	99	62.7	70.2
Foreign institution Ph.D	11,095	1,555	1,026	570	36.7	55.6
Field of Ph.D./employment						
Physics/Astronomy	39,081	4,710	4,179	2,681	56.9	64.2
Chemistry	62,165	7,670	6,728	4,188	54.6	62.2
Mathematics	23,996	4,566	4,030	2,465	54.0	61.2
Computer sciences	4,666	1,270	1,103	737	58.0	66.8
Environmental sciences	16,428	3,605	3,237	2,229	61.8	68.9
Life sciences	136,971	23,698	21,182	13,604	57.4	64.2
Psychology	72,179	7,947	7,000	4,221	53.1	60.3
Social sciences	83,177	6,767	6,014	3,601	53.2	59.9
Engineering	77,799	8,347	6,991	4,248	50.9	60.8
Other/Non-S&E/Unkn	9,223	1,815	1,518	825	45.5	54.3
Year of Ph.D.						
CY1946-CY1957	57,153	6,515	5,952	3,935	60.4	66.1
CY1958-FY1965	62,592	6,347	5,858	3,683	58.0	62.9
FY1966-1969	57,737	5,934	5,408	3,366	56.7	62.2
FY1970-1974	92,478	11,750	10,553	6,475	55.1	61.4
FY1975-1976	35,974	6,449	5,702	3,380	52.4	59.3
FY1977-1978	34,661	4,376	3,888	2,325	53.1	59.8
FY1979-1980	34,710	4,385	3,939	2,309	52.7	58.6
FY1981-1982	35,624	4,698	4,139	2,558	54.4	61.8
FY1983-1984	36,310	4,982	4,336	2,756	55.3	63.6
FY1985-1986	37,229	6,667	5,619	3,525	52.9	62.7
FY1987-1988	39,873	7,752	6,267	4,313	55.6	68.8
Merged cohorts	670	358	229	130	36.3	56.8
Cohort unknown	674	182	92	44	24.2	47.8
Sex						
Men	437,399	44,034	38,875	24,060	54.6	61.9
Women	88,286	26,361	23,107	14,739	55.9	63.8
Race/Ethnic ident.						
Pre-1973 5/	234,518	25,085	22,787	14,510	57.8	63.7
White/Unknown	246,002	30,410	26,659	17,714	58.3	66.4
Minorities	45,165	14,900	12,536	6,575	44.1	52.4

1/ Includes those deceased and those residing in foreign countries.
2/ Excludes those deceased or determined to be out of scope prior to the 1989 survey.
3/ Consists of individuals for whom valid addresses were assumed to have been obtained.
4/ Response rate A is the number of survey responses divided by the number in the active sample; Response rate B is the number of survey responses divided by the number assumed to have been contacted.
5/ Racial/ethnic data not available for stratification purposes prior to FY 1973.

SOURCE: National Research Council

Table A-2. Science/Engineering field classification of specialties: 1989 Survey of Doctorate Recipients

Field	Specialty code
Total	000 to 799
Physical scientists	101 to 299
Chemists	200 to 299
Physicists/astronomers	101 to 199
Mathematical scientists	000 to 060, 082 to 099
Mathematicians	000 to 052, 060, 082 to 099
Statisticians	055
Computer specialists	071 to 081
Environmental scientists	301 to 399
Earth scientists	301 to 360, 388 to 394, 398, 399
Oceanographers	370, 397
Atmospheric scientists	381 to 383
Life scientists	599, 503 to 599
Biological scientists	540 to 599
Agricultural scientists	500, 503 to 519
Medical scientists	520 to 539
Psychologists	600 to 699
Social scientists	501, 700 to 799
Economists	501, 720, 725
Sociologists/anthropologists	700, 710
Other social scientists	703 to 709, 727 to 799
Engineers	400 to 499
Aeronautical/astronautical	400
Chemical	430
Civil	420, 480
Electrical/electronics	436, 437, 440, 445
Materials science	435, 475, 490, 497
Mechanical	470, 485
Nuclear	455
Systems design	476 to 478
Other engineers	410, 415, 450, 460, 465, 479, 486, 487, 498, 499

SOURCE: National Science Foundation, SRS

Table A-3. Listing of a and b parameters for selected demographic groups in science/engineering fields, 1989

Field	Parameter	Total	Women	Whites	Asians	Blacks	Native Americans	Hispanic
Total	a	-0.000038	-0.000113	-0.000041	-0.000158	0.000035	0.00467	0.000783
	b	19.6691	9.7429	19.6003	20.1029	14.1793	8.8208	10.2681
Scientists	a	-0.000039	-0.000118	-0.000044	-0.000009	0.002006	0.008194	0.000544
	b	18.3918	9.9719	18.9563	14.572	5.5149	8.0488	9.7798
Physical scientists	a	-0.000143	-0.000142	-0.000163	-0.000332	0.069121	0.32718	0.008618
	b	19.253	2.7698	19.4208	18.7921	-0.3474	-0.1576	9.3103
Chemists	a	-0.000253	-0.000291	-0.000297	0.000035	0.094054	0.008194 *	0.030208
	b	21.3139	3.459	21.6854	17.1996	-0.6193	8.0488 *	3.9725
Physicists/Astronomers	a	-0.000274	0.000131	-0.000294	0.000388	0.069121 *	0.008194 *	0.064769
	b	16.4484	1.0234	16.4544	16.4606	-0.3474 *	8.0488 *	0.9718
Mathematical scientists	a	-0.000391	-0.00035	-0.000432	-0.002215	0.025629	0.008194 *	0.072267
	b	14.2735	2.3019	14.1913	18.4028	2.0255	8.0488 *	0.4129
Mathematicians	a	-0.000429	-0.000806	-0.000481	0.001171	0.017268	0.008194 *	0.087005
	b	13.6751	2.323	13.7564	14.6279	2.2608	8.0488 *	0.4112
Statisticians	a	0.000879	0.010512	0.001213	0.004161	0.025629 *	0.008194 *	0.072267 *
	b	17.2403	2.4385	17.0254	18.7534	2.0255 *	8.0488 *	0.4129 *
Computer/Info specialists	a	0.000255	0.000682	0.000232	0.001427	0.00299 *	0.008194 *	0.040881
	b	16.7778	6.2403	16.6436	23.1793	21.6846 *	8.0488 *	3.908
Environmental scientists	a	0.000055	-0.000361	-0.000021	0.027254	0.026901 *	0.008194 *	0.00198
	b	11.9997	3.6091	12.3557	0.4727	0.2004 *	8.0488 *	8.2176
Earth scientists	a	0.000221	-0.000257	0.000096	0.043117	0.228931	0.008194 *	0.031908
	b	11.1251	3.8949	11.4902	0.4387	-0.122	8.0488 *	4.1465
Oceanographers	a	0.001906	-0.001003	0.002074	0.012945	0.011082 *	+	0.00198 *
	b	10.2916	2.9794	10.7209	2.8141	2.8433 *	+	8.2176 *
Atmospheric scientists	a	-0.000408	-0.002906	-0.000532	0.082208	0.073025 *	0.008194 *	0.00198 *
	b	18.3432	1.33	19.0707	0.7862	0.8285 *	8.0488 *	8.2176 *
Life scientists	a	-0.000073	-0.000152	-0.000083	0.000191	0.002128	0.013285	0.000083
	b	14.1744	6.4968	14.6472	9.7001	3.1421	2.1473	9.8526
Biological scientists	a	-0.000112	-0.000242	-0.000129	0.00055	0.004652	0.043786	0.003848
	b	15.2314	6.4585	15.6787	10.4808	3.8198	1.0603	9.7548
Agricultural scientists	a	-0.000182	0.000101	-0.000217	0.002611	0.059026	0.013285 *	0.025185
	b	13.5046	3.4377	14.0545	7.8293	0.1376	2.1473 *	4.8338
Medical scientists	a	0.000012	-0.000149	0.000022	0.000327	0.02492	0.030161	0.003842
	b	10.4328	6.7954	10.6076	9.7213	-0.0702	1.3294	3.4274
Psychologists	a	-0.000278	-0.000561	-0.000302	0.001227	0.000668	0.06334	0.006112
	b	21.1809	14.6526	22.081	4.2696	3.3676	4.465	2.4788
Social scientists	a	-0.000315	-0.0009	-0.000346	0.001057	0.009165	0.113838	0.010164
	b	30.2116	17.4385	31.1008	20.441	6.0288	1.7233	7.8156
Economists	a	-0.000519	-0.000395	-0.000554	0.015198	0.052909	0.113838 *	0.082693
	b	35.1308	11.9375	36.2833	19.11	6.023	1.7233 *	1.7492
Sociologists/Anthro	a	-0.00094	-0.002714	-0.001043	0.027304	0.005988	0.113838 *	0.04997
	b	23.9002	19.9852	24.8797	4.0639	4.1426	1.7233 *	4.047
Other social scientists	a	-0.0003	-0.00106	-0.000355	0.014593	0.018569	0.113838 *	0.001782
	b	31.1864	16.9481	32.6287	9.6908	5.9676	1.7233 *	11.3302

[Continued]

Table A-3. Listing of a and b parameters for selected demographic groups in science/engineering field, 1989

Field	Parameter	Total	Women	Whites	Asians	Blacks	Native Americans	Hispanic
Engineers	a	-0.000229	0.000403	-0.000206	-0.001247	0.044493	0.294927	0.007678
	b	27.7203	0.6848	23.4432	38.6866	9.0555	-1.4674	19.714
Aero/Astro engineers	a	-0.000718	0.014531	0.000366	0.004345	0.044493 *	0.294927 *	0.007678 *
	b	34.5869	0.1854	26.1905	36.9667	9.0555 *	-1.4674 *	19.714 *
Chemical engineers	a	0.000056	0.000252	0.000639	-0.001247 *	0.044493 *	+ *	0.219189
	b	29.9113	0.2233	24.6426	38.6866 *	9.0555 *	+ *	2.0804
Civil engineers	a	-0.00034	0.000735	0.001715	0.007406 *	0.044493 *	0.294927 *	0.191665
	b	35.2012	0.6727	24.48	36.8994 *	9.0555 *	-1.4674 *	-0.1295
Elec/Electron engineers	a	-0.000103	0.00359	-0.000085	0.000127	0.093139	0.294927 *	0.052766
	b	31.4588	0.3702	29.8645	37.3996	-0.5188	-1.4674 *	19.1615
Materials sci engineers	a	0.000869	0.000505	0.001433	0.007712	0.044493 *	0.294927 *	-0.012596
	b	25.6243	0.4708	20.8353	33.4111	9.0555 *	-1.4674 *	4.4029
Mechanical engineers	a	0.002289	-0.000468	0.002155	0.03903	0.044493 *	0.294927 *	0.167554
	b	21.7991	0.2012	22.5327	6.2044	9.0555 *	-1.4674 *	3.795
Nuclear engineers	a	0.009397	-0.004731	0.00843	0.181446	0.088593 *	+	0.007678 *
	b	17.5485	0.4592	19.0905	1.765	-0.1418 *	+	19.714 *
Systems design engineers	a	0.000581	0.025141	0.001498	0.171581	0.124952 *	0.294927 *	0.007678 *
	b	29.0273	0.6964	26.5294	4.9785	6.4466 *	-1.4674 *	19.714 *
Other engineers	a	0.000483	0.001218	0.000419	0.063851	0.153361	0.294927 *	0.139056
	b	22.6591	1.0208	23.1334	-0.186	1.2077	-1.4674 *	-0.1702

* Direct estimates, based on the method described in the accompanying text, are not available; data shown are considered useful approximations. (See accompanying text for explanation.)

+ No cases reported.

SOURCE: National Research Council

Table A-4. Approximate standard errors of estimated number of scientists and engineers by field: 1989 Survey of Doctorate Recipients

Estimated number	Total S&E	Total sci.	Phys. sci.	Math sci.	Comp. sci.	Envir. sci.	Life sci.	Psych	Soc. sci.	Total engr.	Aero/ Astro engr.	Chem. engr.	Civil engr.	Elec/ Elctrn engr.	Matls. sci. engr.	Mech. engr.
50	30	30	30	30	30	20	30	30	40	40	40	40	40	40	40	30
100	40	40	40	40	40	30	40	50	50	50	60	50	60	60	50	50
200	60	60	60	50	60	50	50	70	80	70	80	80	80	80	70	70
500	100	100	100	80	90	80	80	100	120	120	130	120	130	130	110	110
700	120	110	120	100	110	90	100	120	140	140	150	140	160	150	140	130
1,000	140	140	140	120	130	110	120	140	170	170	180	170	190	180	160	160
2,500	220	210	220	180	210	170	190	230	270	260	290	270	290	280	260	260
5,000	310	300	300	250	300	250	260	310	380	360	390	390	410	390	390	410
10,000	440	420	420	320	440	350	370	430	520	500	--	--	--	550	--	--
25,000	680	660	630	--	--	--	560	600	750	740	--	--	--	--	--	--
50,000	940	910	780	--	--	--	730	600	850	900	--	--	--	--	--	--
75,000	1,120	1,080	800	--	--	--	810	--	700	890	--	--	--	--	--	--
100,000	1,260	1,200	--	--	--	--	830	--	--	--	--	--	--	--	--	--
150,000	1,450	1,370	--	--	--	--	--	--	--	--	--	--	--	--	--	--
200,000	1,550	1,460	--	--	--	--	--	--	--	--	--	--	--	--	--	--
250,000	1,590	1,470	--	--	--	--	--	--	--	--	--	--	--	--	--	--
300,000	1,580	1,420	--	--	--	--	--	--	--	--	--	--	--	--	--	--
400,000	1,340	1,060	--	--	--	--	--	--	--	--	--	--	--	--	--	--

SOURCE: National Research Council

Table A-5. Approximate standard errors of estimated number of women scientists and engineers by field: 1989 Survey of Doctorate Recipients

Estimated number	Total S&E	Total sci.	Phys. sci.	Math sci.	Comp. sci.	Envir. sci.	Life sci.	Psych	Soc. sci.	Total engr.	Aero/ Astro engr.	Chem. engr.	Civil engr.	Elec/ Elctrn engr.	Matls. sci. engr.	Mech. engr.
50	20	20	10	10	20	10	20	30	30	10	10	3	10	10	5	4
100	30	30	20	20	30	20	30	40	40	10	10	5	10	10	7	5
200	40	40	20	20	40	30	40	50	60	10	20	7	--	10	11	--
500	70	70	40	30	60	40	60	80	90	20	--	--	--	--	--	--
700	80	80	40	40	70	50	70	100	110	30	--	--	--	--	--	--
1,000	100	100	50	40	80	60	80	120	130	30	--	--	--	--	--	--
2,500	150	160	80	--	--	--	120	180	190	70	--	--	--	--	--	--
5,000	210	220	100	--	--	--	170	240	250	--	--	--	--	--	--	--
10,000	290	300	--	--	--	--	220	300	290	--	--	--	--	--	--	--
25,000	420	420	--	--	--	--	260	--	--	--	--	--	--	--	--	--
50,000	450	450	--	--	--	--	--	--	--	--	--	--	--	--	--	--
75,000	310	290	--	--	--	--	--	--	--	--	--	--	--	--	--	--

SOURCE: National Research Council

BEST COPY AVAILABLE

Table A-6. Approximate standard errors of estimated number of black scientists and engineers by field: 1989 Survey of Doctorate Recipients

Estimated number	Total S&E	Total sci.	Phys. sci.	Math sci.	Comp. sci.	Envir. sci.	Life sci.	Psych	Soc. sci.	Total engr.	Aero/ Astro engr.	Chem. engr.	Civil engr.	Elec/ Elctrn engr.	Matls. sci. engr.	Mech. engr.
50	30	20	10	10	30	10	10	10	20	20	20	*	20	10	20	*
100	40	20	30	20	50	20	20	20	30	40	40	--	40	30	40	--
200	50	30	50	--	--	30	30	30	40	60	--	--	--	--	--	--
500	80	60	130	--	--	--	50	40	70	130	--	--	--	--	--	--
700	100	70	180	--	--	--	60	50	90	170	--	--	--	--	--	--
1,000	120	90	--	--	--	--	70	60	120	--	--	--	--	-	--	--
2,500	190	160	--	--	--	--	--	--	--	--	--	--	--	--	--	--
5,000	270	280	--	--	--	--	--	--	--	--	--	--	--	--	--	--

*Less than 50 cases reported.

SOURCE: National Research Council

Table A-7. Approximate standard errors of estimated number of Asian scientists and engineers by field: 1989 Survey of Doctorate Recipients

Estimated number	Total S&E	Total sci.	Phys. sci.	Math sci.	Comp. sci.	Envir. sci.	Life sci.	Psych	Soc. sci.	Total engr.	Aero/ Astro engr.	Chem. engr.	Civil engr.	Elec/ Elctrn engr.	Matls. sci. engr.	Mech. engr.
50	30	30	30	30	30	10	20	10	30	40	40	40	40	40	40	20
100	40	40	40	40	50	20	30	20	50	60	60	60	60	60	60	30
200	60	50	60	60	70	30	40	30	60	90	90	90	90	90	80	50
500	100	90	100	90	110	80	70	50	100	140	140	140	140	140	140	110
700	120	100	110	110	130	120	80	60	120	160	170	160	170	160	160	150
1,000	140	120	140	130	160	170	100	70	150	190	200	190	210	190	200	210
2,500	220	190	210	--	--	--	160	--	240	300	--	--	--	310	--	--
5,000	310	270	290	--	--	--	230	--	--	400	--	--	--	--	--	--
10,000	430	380	--	--	--	--	--	--	--	510	--	--	--	--	--	--
25,000	640	600	--	--	--	--	--	--	--	--	--	--	--	--	--	--

SOURCE: National Research Council

Table A-8. Approximate standard errors for estimated percents of scientists and engineers by field: 1989 Survey of Doctorate Recipients

Base Number of Percent	Estimated Percent						
	1/99	2/98	5/95	10/90	15/85	25/75	50
50	6.2	8.8	13.7	18.8	22.4	27.2	31.4
100	4.4	6.2	9.7	13.3	15.8	19.2	22.2
200	3.1	4.4	6.8	9.4	11.2	13.6	15.7
500	2.0	2.8	4.3	6.0	7.1	8.6	9.9
700	1.7	2.3	3.7	5.0	6.0	7.3	8.4
1,000	1.4	2.0	3.1	4.2	5.0	6.1	7.0
2,500	0.9	1.2	1.9	2.7	3.2	3.8	4.4
5,000	0.6	0.9	1.4	1.9	2.2	2.7	3.1
10,000	0.4	0.6	1.0	1.3	1.6	1.9	2.2
25,000	0.3	0.4	0.6	0.8	1.0	1.2	1.4
50,000	0.2	0.3	0.4	0.6	0.7	0.9	1.0
75,000	0.2	0.2	0.4	0.5	0.6	0.7	0.8
100,000	0.1	0.2	0.3	0.4	0.5	0.6	0.7
150,000	0.1	0.2	0.2	0.3	0.4	0.5	0.6
200,000	0.1	0.1	0.2	0.3	0.4	0.4	0.5
250,000	0.1	0.1	0.2	0.3	0.3	0.4	0.4
300,000	0.1	0.1	0.2	0.2	0.3	0.4	0.4
400,000	0.1	0.1	0.2	0.2	0.3	0.3	0.4

SOURCE: National Research Council

Table A-9. Approximate standard errors for estimated percents of women scientists and engineers by field: 1989 Survey of Doctorate Recipients

Base Number of Percent	Estimated Percent						
	1/99	2/98	5/95	10/90	15/85	25/75	50
50	4.4	6.2	9.6	13.2	15.8	19.1	22.1
100	3.1	4.4	6.8	9.4	11.1	13.5	15.6
200	2.2	3.1	4.8	6.6	7.9	9.6	11.0
500	1.4	2.0	3.0	4.2	5.0	6.0	7.0
700	1.2	1.7	2.6	3.5	4.2	5.1	5.9
1,000	1.0	1.4	2.2	3.0	3.5	4.3	4.9
2,500	0.6	0.9	1.4	1.9	2.2	2.7	3.1
5,000	0.4	0.6	1.0	1.3	1.6	1.9	2.2
10,000	0.3	0.4	0.7	0.9	1.1	1.4	1.6
25,000	0.2	0.3	0.4	0.6	0.7	0.9	1.0
50,000	0.1	0.2	0.3	0.4	0.5	0.6	0.7
75,000	0.1	0.2	0.2	0.3	0.4	0.5	0.6

SOURCE: National Research Council

Table A-10. Approximate standard errors for estimated percents of black scientists and engineers by field: 1989 Survey of Doctorate Recipients

Base Number of Percent	Estimated Percent						
	1/99	2/98	5/95	10/90	15/85	25/75	50
50	5.3	7.5	11.6	16.0	19.0	23.1	26.6
100	3.7	5.3	8.2	11.3	13.4	16.3	18.8
200	2.6	3.7	5.8	8.0	9.5	11.5	13.3
500	1.7	2.4	3.7	5.1	6.0	7.3	8.4
700	1.4	2.0	3.1	4.3	5.1	6.2	7.1
1,000	1.2	1.7	2.6	3.6	4.3	5.2	6.0
2,500	0.7	1.1	1.6	2.3	2.7	3.3	3.8
5,000	0.5	0.7	1.2	1.6	1.9	2.3	2.7

SOURCE: National Research Council

Table A-11. Approximate standard errors for estimated percents of Asian scientists and engineers by field: 1989 Survey of Doctorate Recipients

Base Number of Percent	Estimated Percent						
	1/99	2/98	5/95	10/90	15/85	25/75	50
50	6.3	8.9	13.8	19.0	22.6	27.5	31.7
100	4.5	6.3	9.8	13.5	16.0	19.4	22.4
200	3.2	4.4	6.9	9.5	11.3	13.7	15.9
500	2.0	2.8	4.4	6.0	7.2	8.7	10.0
700	1.7	2.4	3.7	5.1	6.1	7.3	8.5
1,000	1.4	2.0	3.1	4.3	5.1	6.1	7.1
2,500	0.9	1.3	2.0	2.7	3.2	3.9	4.5
5,000	0.6	0.9	1.4	1.9	2.3	2.7	3.2
10,000	0.4	0.6	1.0	1.3	1.6	1.9	2.2
25,000	0.3	0.4	0.6	0.9	1.0	1.2	1.4

SOURCE: National Research Council

Appendix B. Survey Questionnaire

Page

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1989 SURVEY OF DOCTORAL SCIENTISTS AND ENGINEERS

OMB No. 3145-0020
Expires: 12-31-90

CONDUCTED BY THE NATIONAL RESEARCH COUNCIL WITH THE SUPPORT OF THE NATIONAL SCIENCE FOUNDATION, THE NATIONAL INSTITUTES OF HEALTH, THE DEPARTMENT OF AGRICULTURE, AND THE DEPARTMENT OF ENERGY

NOTE: THIS INFORMATION IS SOLICITED UNDER THE AUTHORITY OF THE NATIONAL SCIENCE FOUNDATION ACT OF 1950, AS AMENDED. ALL INFORMATION YOU PROVIDE WILL BE TREATED AS CONFIDENTIAL, WILL BE SAFEGUARDED IN ACCORDANCE WITH THE PROVISIONS OF THE PRIVACY ACT OF 1974, AND WILL BE USED FOR STATISTICAL PURPOSES ONLY. INDIVIDUAL RECORDS MAY BE PROVIDED TO THE SURVEY SPONSORS (LISTED ABOVE). ANY OTHER DATA RELEASED WILL BE ONLY IN THE FORM OF STATISTICAL SUMMARIES OR IN A FORM WHICH DOES NOT IDENTIFY INFORMATION ABOUT ANY PARTICULAR PERSON. YOUR RESPONSE IS ENTIRELY VOLUNTARY AND YOUR FAILURE TO PROVIDE SOME OR ALL OF THE REQUESTED INFORMATION WILL IN NO WAY ADVERSELY AFFECT YOU.

PUBLIC REPORTING BURDEN FOR THIS COLLECTION OF INFORMATION IS ESTIMATED TO AVERAGE 14 MINUTES PER RESPONSE, INCLUDING THE TIME FOR REVIEWING INSTRUCTIONS, SEARCHING EXISTING DATA SOURCES, GATHERING AND MAINTAINING THE DATA NEEDED, AND COMPLETING AND REVIEWING THE COLLECTION OF INFORMATION. SEND COMMENTS REGARDING THIS BURDEN ESTIMATE OR ANY OTHER ASPECT OF THIS COLLECTION OF INFORMATION, INCLUDING SUGGESTIONS FOR REDUCING THIS BURDEN, TO HERMAN FLEMING, NATIONAL SCIENCE FOUNDATION, 1800 G STREET, NW, WASHINGTON, D.C. 20550; AND TO THE OFFICE OF MANAGEMENT AND BUDGET PAPERWORK REDUCTION PROJECT (OMB NO. 3145-0020), WASHINGTON, D.C. 20503.

Please check the following information. If it is inaccurate or missing, please provide the correct information in the spaces provided.

Institution/Year of Doctorate: _____

Date of Birth: _____

PART I - EMPLOYMENT PROFILE

1. During February 1989, what was your employment status (includes postdoctoral appointment*)?

1 ____ Employed full-time (Go to #6)
2 ____ Employed part-time (Go to #2)
3 ____ Postdoctoral appointment*
A ____ Full-time (Go to #6) B ____ Part-time (Go to #2)
4 ____ Unemployed and seeking full-time or part-time employment (Go to #4)
5 ____ Not employed and not seeking employment (Go to #5)
6 ____ Retired and not employed (Go to #22)
7 ____ Other, specify _____

Temporary appointment in academia, industry, or government, the primary purpose of which is to provide for continued education or experience in research.

2. If you held a part-time position during February 1989:

A) Where you seeking a full-time position?
1 ____ Yes 2 ____ No

B) How many part-time positions did you hold? _____

C) On average, how many hours per week did you work?
_____Hrs

3. What was the MOST important reason for holding a part-time position?

1 ____ Part-time position preferred
2 ____ Full-time position not available
3 ____ Family responsibilities
4 ____ Other, specify _____

(Go to #6)

4. If you were unemployed but seeking employment during February 1989, which of the following factors MOST restricted your job search?

1 ____ Geographic location
2 ____ Family responsibilities
3 ____ Need for part-time employment
4 ____ Other, specify _____
5 ____ No restrictions

(Go to #15)

5. If you were not employed and not seeking work during February 1989, what was the MOST important reason for not seeking work?

1 ____ Temporarily absent for health or personal reasons
2 ____ Family responsibilities
3 ____ Suitable job not available
4 ____ Other, specify _____

(Go to #15)

PART I - EMPLOYMENT PROFILE - Continued

6. Please give the name of your principal employer (company, organization, postdoctoral institution, etc. or, if self-employed, write "self") and actual place of employment during FEBRUARY 1989.

_____
Name of Employer

_____
City County State or Foreign Country ZIP

7. Which category best describes the type of your principal employment OR postdoctoral appointment during FEBRUARY 1989?

0 ___ Self-employed } (Go to #8)
1 ___ Business or industry }
2 ___ Junior college, 2-year college, technical institute
3 ___ Medical school (including university-affiliated hospital or medical center)
4 ___ 4-year college
5 ___ University, other than medical school
6 ___ Elementary, middle, or secondary school system
7 ___ Private foundation (Go to #9)
8 ___ Hospital or clinic
9 ___ U.S. military service, active duty, or Commissioned Corps, e.g., USPHS, NOAA
10 ___ U.S. government, civilian employee
11 ___ State government
12 ___ Local or other government, specify _____
13 ___ Nonprofit organization, other than those listed above
14 ___ Other, specify _____

8. If you were employed by business/industry or if you were self-employed, how would you classify the organization listed in #6?

(Please enter code from the enclosed Employer Classification List. If the organization conducts its activities at different locations, enter the code for the activity conducted at the location where you were employed.) _____

9. From the enclosed Employment Specialties List, select and enter both number and title of the employment field most closely related to your principal employment or postdoctoral appointment during FEBRUARY 1989. Write your employment field if it is not on the list.

_____ _____
Number Employment Field

10. If you were employed during FEBRUARY 1989 in a field other than science engineering, what was the MOST important reason for your decision to take the position?

1 ___ Better pay
2 ___ More attractive career options
3 ___ Preferred specific geographic location
4 ___ Constraints due to family status
5 ___ Position in Ph.D. field not available
6 ___ Change in career/professional interests
7 ___ Other, specify _____

11. If you were employed by an institution of higher education in February 1989:

A) What was your ***faculty*** rank?

1 ___ Professor
2 ___ Associate professor
3 ___ Assistant professor
4 ___ Instructor
5 ___ Lecturer
6 ___ Adjunct faculty
7 ___ Other, specify _____
8 ___ Does Not Apply Title

B) What was your tenure status?

1 ___ Tenured, in 19 ___
2 ___ Not tenured, in tenure track
3 ___ Not tenured, not in tenure track
4 ___ Tenure not applicable

12. From the activities listed below, select your primary and secondary work activities for your principal job (as reported in #6), in terms of time devoted during a typical week.

Enter the appropriate code (1-16) for each in the specified space.

_____Primary activity _____ Secondary activity

1. Teaching
2. Basic research (i.e., study directed toward gaining scientific knowledge primarily for its own sake)
3. Applied research (i.e., study directed toward gaining scientific knowledge in an effort to meet a recognized need)
4. Development of equipment, products, systems
5. Design of equipment, processes, models
6. Management/administration of R&D
7. Management/administration of educational/other programs
8. Report and technical writing, editing
9. Professional service to individuals, clinical diagnosis, psychotherapy
10. Consulting
11. Operations-production, maintenance, construction, installation
12. Quality control, testing, evaluation
13. Sales, marketing, purchasing, customer and public relations
14. Statistical work-survey work, forecasting, statistical analysis
15. Computer applications
16. Other, specify: _____

13. During a typical week, what percentage of your professional work time did you devote to the items listed in #12?

Entries should total 100%

_____% Primary work activity
_____% Secondary work activity
_____% Other work activities
100% = TOTAL

14. What was the basic annual salary* associated with your principal professional employment during FEBRUARY 1989? If you were on a postdoctoral appointment (see question #1 for definition), what was your stipend plus allowances?

$ _____per year

Check whether salary was for ___ 9-10 months or ___ 11-12 months

Basic salary is your annual salary before deduction for income tax, social security, retirement, etc., but does not include bonuses, overtime, summer teaching, or other payment for professional work.

PART I - EMPLOYMENT PROFILE - Continued

15. Since receiving the doctorate, how many full-time equivalent (FTE) years of professional work experience have you had? _____Year(s)

16a. Was any of the work in which you were engaged during the past year supported or sponsored by U.S. Government funds?

1 ____ Yes 2 ____ No 3 ____ Don't Know

16b. If YES, which of these agencies or departments were supporting your work? Mark all that apply.

1 ____ AID (Agency for International Development)
2 ____ Department of Agriculture
3 ____ Department of Commerce
4 ____ Department of Defense
5 ____ Department of Energy
6 ____ Department of Education
7 ____ National Institutes of Health (DHHS)
8 ____ Other DHHS
9 ____ Department of Housing and Urban Development
10 ____ Department of the Interior
11 ____ Department of Justice
12 ____ Department of Labor
13 ____ Department of Transportation
14 ____ EPA (Environmental Protection Agency)
15 ____ NASA (National Aeronautics and Space Administration)
16 ____ NSF (National Science Foundation)
17 ____ Nuclear Regulatory Commission
18 ____ Other, specify _____
19 ____ Don't know source agency

17a. **Since you received your doctorate, have you ever spent three months or more conducting research in a country other than the United States?**

1_____Yes (Go to #18a) 2 _____No (Go to #17b)

17b. From the list below, select the primary and secondary factors that would encourage you to conduct research in a country other than the United States?

_____Primary factor _____ Secondary factor

1. Better sabbatical leave policy
2. More financial support
3. Better foreign language training opportunities
4. Greater access to information on foreign research opportunities (e.g., funding sources, research activities)
5. Other, specify _____
6. I would not consider conducting research outside the United States at this time

18a. From this list of selected areas of national interest, indicate the ONE area to which you devoted the MOST professional time during a typical week at the job reported in #6.

1 ____ Energy and fuel
2 ____ Health
3 ____ Environment
4 ____ Education
5 ____ National defense
6 ____ Food or Agriculture
7 ____ Biotechnology
8 ____ Mineral resources
9 ____ Community development and service
10 ____ Housing (planning, design, construction)
11 ____ Transportation
12 ____ Communications
13 ____ Space
14 ____ None of the above

18b. What percent of your professional time did you devote to the area listed in #18a during a typical week?

_____percent

If you selected ENERGY AND FUEL (Category 1) in Question #18a, please answer the following questions. Otherwise please skip to #22.

19. From the list below, check the ONE energy source that involved the LARGEST proportion of your energy related work during FEBRUARY 1989.

1 ____ Coal and coal products
2 ____ Petroleum (including oil shale and tar sands) or natural gas
3 ____ Fission
4 ____ Fusion
5 ____ Hydroenergy
6 ____ Direct solar (including space and water heating, thermal, electric)
7 ____ Indirect solar (winds, tides, biomass, etc.)
8 ____ Geothermal
9 ____ Other, specify _____

20. Please read the following list of energy-related activities and mark the activity(ies) in which you were engaged during FEBRUARY 1989.

1 ____ Exploration
2 ____ Extraction (gas, oil, mining)
3 ____ Manufacture of energy-related components or products
4 ____ Fuel processing (including refining and enriching)
5 ____ Electric power generation
6 ____ Transportation, transmission, distribution of fuel or energy
7 ____ Energy storage
8 ____ Energy utilization, management
9 ____ Fuel reprocessing or disposal
10 ____ Energy conservation
11 ____ Environmental impact (health, economic, etc.)
12 ____ Education, training
13 ____ Research and development
14 ____ Other, specify _____

21. Please enter the number 1–14 from question #20 that BEST describes the activity in which you spent MOST of your energy-related time. _____

PART II - DEMOGRAPHIC CHARACTERISTICS

22. Citizenship

1 ____ U.S. Native Born
2 ____ U.S. Naturalized
3 ____ Non-U.S., Immigrant (Perm. Res.)
4 ____ Non-U.S., Non-Immigrant (Temp. Res.)

If NON-U.S., specify country of citizenship

_____

23a. What is your racial background?

1 ____ American Indian or Alaskan Native
2 ____ Asian or Pacific Islander
3 ____ Black
4 ____ White

23b. Is your ethnic heritage Hispanic?

1 ____ Yes
2 ____ No

If YES, is it:
1 ____ Mexican American
2 ____ Puerto Rican
3 ____ Other Hispanic

24. Are you physically handicapped?

1 ____ Yes
2 ____ No

If yes, what is the nature of your handicap(s)? (Mark as many as apply)

1 ____ No useful sight
2 ____ No useful hearing
3 ____ No use of arms or legs
4 ____ Other, specify _____

25. What is your marital status?

1 ____ Never Married
2 ____ Married
3 ____ Separated, Divorced
4 ____ Widowed

26. Do you have any children living with you who are:

Under 6 years of age?

1 ____ Yes How many? _____
2 ____ No

From 6 to 17 years of age?

1 ____ Yes How many? _____
2 ____ No

27. In the event it is necessary to contact you to clarify some of the information you provided, please give the telephone number at which you can be reached during the day.

_____ _____
(Area Code) (Number)

28. Thank you for completing the questionnaire. Please return the completed form in the enclosed envelope to the National Research Council, GR442, 2101 Constitution Avenue, N.W., Washington, D.C. 20418

EMPLOYMENT SPECIALTIES LIST

MATHEMATICAL SCIENCES

000 - Algebra
010 - Analysis & Functional Analysis
085 - Applied Mathematics
089 - Combinatorics & Finite Mathematics
020 - Geometry
030 - Logic (see also 834)
055 - Math Statistics (see also 544, 670, 725, 727)
040 - Number Theory
082 - Operations Research (see also 478)
052 - Probability
060 - Topology
098 - Mathematics, General
099 - Mathematics, Other*

COMPUTER AND INFORMATION SCIENCES

073 - Hardware Systems
081 - Information Sci. & Systems*
074 - Intelligent Systems
072 - Software Systems
075 - Systems Analysis
071 - Theory
079 - Computer Sciences, Other* (see also 437, 476)

PHYSICS & ASTRONOMY

132 - Acoustics
101 - Astronomy
102 - Astrophysics
110 - Atomic & Molecular
120 - Electromagnetism
140 - Elementary Particles
134 - Fluids
150 - Nuclear Structure
136 - Optics
135 - Plasma
157 - Polymer
160 - Solid State
198 - Physics, General
199 - Physics, Other*

CHEMISTRY

260 - Agricultural & Food
200 - Analytical
280 - Biochemistry (see also 540)
210 - Inorganic
230 - Nuclear
220 - Organic
270 - Pharmaceutical
240 - Physical
275 - Polymer
255 - Structural
215 - Synthetic Inorganic & Organometallic
225 - Synthetic Organic & Natural Products
250 - Theoretical
298 - Chemistry, General
299 - Chemistry, Other*

EARTH, ENVIRONMENTAL, AND MARINE SCIENCES

382 - Atmospheric Dynamics
381 - Atmospheric Physics & Chemistry
383 - Atmos. & Meteorol. Sci., Other*
393 - Economic Geology
392 - Engineering Geology
305 - Geochemistry
350 - Geomorph. & Glacial Geology
341 - Geophysics (Solid Earth)
301 - Mineralogy, Petrology
320 - Paleontology
394 - Petroleum Geology
310 - Stratigraphy, Sedimentation
330 - Structural Geology
398 - Earth Sciences, General
399 - Earth Sciences, Other*
360 - Hydrology & Water Resources
370 - Oceanography
397 - Marine Sciences, Other*
388 - Environmental Sciences, General (see also 480, 528)
389 - Environmental Sciences, Other*

ENGINEERING

400 - Aerospace, Aeronautical & Astronautical
410 - Agricultural
415 - Bioengineering & Biomedical
435 - Ceramic
430 - Chemical
420 - Civil
436 - Communications
437 - Computer (see also 071-081)
440 - Electrical
445 - Electronics
460 - Engineering Mechanics
465 - Engineering Physics
479 - Fuel Technology & Petroleum
450 - Industrial & Manufacturing
497 - Materials Science & Engineering
470 - Mechanical
475 - Metallurgical & Phys. Met. Engr.
486 - Mining & Mineral
485 - Naval Arch. & Marine Engr.
455 - Nuclear
487 - Ocean
478 - Operations Research (see also 082)
490 - Polymer
480 - Sanitary & Environmental Health
476 - Systems Design & Systems Science (see also 072, 073, 074)
498 - Engineering, General
499 - Engineering, Other*

AGRICULTURAL SCIENCES

501 - Agricultural Economics
500 - Agronomy
508 - Animal Breeding & Genetics
509 - Animal Nutrition
512 - Animal Sciences, Other*
51A - Dairy Sciences
515 - Fisheries Sciences
503 - Food Science and or Technology (see also 573)
505 - Forestry
506 - Horticulture
513 - Plant Breeding & Genetics
511 - Plant Path. (see also 553)
514 - Plant Sciences, Other*
51B - Poultry Sciences
507 - Soil Sciences
516 - Wildlife Management
518 - Agriculture, General
519 - Agriculture, Other*

MEDICAL SCIENCES

532 - Animal Pathology
530 - Audiology & Speech Pathology
528 - Environmental Health
524 - Hospital Administration
533 - Human Pathology
520 - Medicine & Surgery
526 - Nursing
527 - Parasitology
536 - Pharmacology
537 - Pharmacy
522 - Public Health & Epidemiology
523 - Veterinary Medicine
538 - Medical Sciences, General
539 - Medical Sciences, Other*

BIOLOGICAL SCIENCES

545 - Anatomy
556 - Animal Genetics
558 - Animal Physiology
551 - Bacteriology
574 - Behavior Ethology
540 - Biochemistry (see also 280)
544 - Biometrics & Biostatistics (see also 055, 670, 725, 727)
542 - Biophysics
550 - Botany
546 - Cell Biology
560 - Ecology
547 - Embryology
549 - Endocrinology
571 - Entomology
573 - Food Science and or Technology (see also 503)
557 - Human Genetics
559 - Human Physiology
548 - Immunology
575 - Microbiology
572 - Molecular Biology
589 - Neurosciences
576 - Nutrition & Dietetics
552 - Plant Genetics
553 - Plant Path. (see also 511)
567 - Plant Physiology
590 - Toxicology
569 - Zoology
598 - Biological Sciences, General
599 - Biological Sciences, Other*

PSYCHOLOGY

600 - Clinical
603 - Cognitive
642 - Comparative
610 - Counseling & Guidance
620 - Developmental & Gerontological
630 - Educational
641 - Experimental
650 - Industrial Organizational
660 - Personality
643 - Physiological
670 - Psychometrics (see also 055, 544, 725, 727)
675 - Quantitative
635 - School
680 - Social
698 - Psychology, General
699 - Psychology, Other*

SOCIAL SCIENCES

700 - Anthropology
703 - Archeology
745 - Area Studies*
708 - Communications
760 - Criminology & Criminal Justice
730 - Demography
725 - Econometrics (see also 055, 544, 670, 727)
720 - Economics
740 - Geography
775 - History & Philosophy of Sci.
755 - International Relations
709 - Linguistics
751 - Political Sci. & Government
752 - Public Administration
753 - Public Policy Studies
727 - Social Statistics (see also 055, 544, 670, 725)
710 - Sociology
770 - Urban & Regional Planning
798 - Social Sciences, General
799 - Social Sciences, Other*

HUMANITIES

811 - American Literature
827 - Classics
836 - Comparative Literature
813 - English Language
814 - English Literature
823 - French
821 - German
826 - Italian
822 - Russian
824 - Spanish & Portuguese
829 - Languages, Other*
839 - Letters, Other*

804 - History, American
805 - History, European
806 - History, Other*

808 - American Studies
802 - Art History & Criticism
830 - Music
834 - Philosophy (see also 030)
833 - Religious Studies (see also 881)
831 - Speech & Debate
809 - Theatre & Theatre Criticism
878 - Humanities, General
879 - Humanities, Other*

EDUCATION AND PROFESSIONAL FIELDS

801 - Applied Art
888 - Architec. & Environ. Design
882 - Business & Management
883 - Home Economics
884 - Journalism
886 - Law, Jurisprudence
891 - Library & Archival Sciences
887 - Social Work
881 - Theology (see also 833)
896 - Professional Fields, General
897 - Professional Fields, Other*

938 - Education (other than teaching in a field listed above)

899 - Other Fields*

*Identify the specific field in the space provided in #9 on the questionnaire.

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EMPLOYER CLASSIFICATION LIST

CODE	
	MANUFACTURING
01	Primary metals products
02	Fabricated metals products
03	Computers and computing equipment
04	Nonelectrical machinery (including engines & turbines, construction machinery, metal working, and industrial machinery; and excluding computing and computing equipment)
	Electrical equipment
05	Household appliances (excluding radios and televisions)
06	Radios and televisions
07	Communications equipment
08	Other electrical equipment (including electric motors, transmissions equipment, and generators)
	Transportation equipment
09	Aircraft, aircraft engines and parts
10	Motor vehicles and equipment
11	Guided missiles and space vehicles and parts
12	Other transportation equipment (including railroad and parts)
13	Ordnance (including arms manufacture and ammunition)
14	Professional and scientific instruments
	Chemicals and allied products
15	Drugs and pharmaceuticals
16	Other chemicals and allied products
17	Petroleum and coal products (including petroleum refining)
18	Printing and publishing (including software publishing)
19	Other manufacturing
20	**CONSTRUCTION**
	MINING AND PETROLEUM EXTRACTION
21	Coal mining
22	Petroleum and gas extraction
23	Other mining
	TRANSPORTATION, COMMUNICATION, AND UTILITIES
24	Transportation
25	Communications
26	Utilities and sanitary services
	WHOLESALE AND RETAIL TRADE
27	Wholesale trade
28	Retail trade
29	**FINANCE, INSURANCE, AND REAL ESTATE**
	SERVICES
30	Computer and data processing services
31	Engineering, architectural, and surveying services
32	Other services
40	**OTHER**

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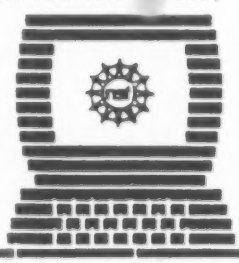

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